

Safety Data Sheet



Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

- Product Name** • Oxygen (0.0005–23.5%), Carbon monoxide (0.0005 - 0.09%), Hydrogen Sulfide (0.0005 - 0.025%), Butane (0.0005 - 1.0%), Nitrogen (Balance)
- Product Code** • 90091

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

- Relevant identified use(s)** • Calibration standard

1.3 Details of the supplier of the safety data sheet

- Manufacturer** • Air Liquide
2700 Post Oak Blvd.
Houston, TX 77056
United States
www.us.airliquide.com
sds@airliquide.com
- Telephone (Technical)** • 713-896-2896
- Telephone (Technical)** • 800-819-1704

1.4 Emergency telephone number

- Manufacturer** • 800-424-9300 - CHEMTREC
- Manufacturer** • +1 703-527-3887 - Outside United States

Section 2: Hazards Identification

EU/EEC

According to EU Directive 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

- CLP** • Compressed Gas - H280
- DSD/DPD** • Not classified

2.2 Label Elements

CLP

WARNING



Hazard statements • H280 - Contains gas under pressure; may explode if heated

Precautionary statements

Storage/Disposal • P403 - Store in a well-ventilated place.

DSD/DPD

Risk phrases • No label element(s) required

2.3 Other Hazards

CLP

- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD

- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. This preparation is not considered dangerous according to European Directive 1999/45/EC.

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012

- Compressed Gas - H280
Simple Asphyxiant

2.2 Label elements

OSHA HCS 2012

WARNING



Hazard statements • Contains gas under pressure; may explode if heated - H280
May displace oxygen and cause rapid suffocation.

Precautionary statements

Storage/Disposal • Store in a well-ventilated place. - P403

2.3 Other hazards

OSHA HCS 2012

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

2.1 Classification of the substance or mixture

WHMIS

- Compressed Gas - A

2.2 Label elements

WHMIS



- Compressed Gas - A

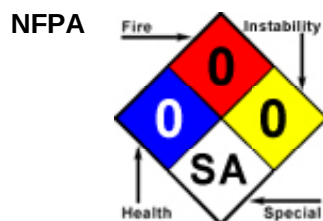
2.3 Other hazards

WHMIS

- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. In Canada, the product mentioned above is considered hazardous under the

Workplace Hazardous Materials Information System (WHMIS).

2.4 Other information



Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance in accordance with Regulation (EC) No 1272/2008.

3.2 Mixtures

Hazardous Components					
Chemical Name	Identifiers	%(weight)	LD50/LC50	Classifications According to Regulation/Directive	Comments
Nitrogen	CAS:7727-37-9 EINECS:231-783-9	75.385% TO 99.998%	NDA	EU DSD/DPD: Not Classified - Criteria not met EU CLP: Self Classified: Press Gas - Comp., H280 OSHA HCS 2012:	NDA
Oxygen	CAS:7782-44-7 EC Number:231-956-9	0.0005% TO 23.5%	NDA	EU DSD/DPD: Annex I: O; R8 EU CLP: Annex VI: Ox. Gas 1, H270; Press. Gas - Comp., H280 OSHA HCS 2012: Ox. Gas 1; Press Gas. - Comp.	NDA
Butane	EC Number:203-448-7	0.0005% TO 1%	Inhalation-Rat LC50 • 658 g/m ³ 4 Hour(s)	EU DSD/DPD: Annex I: F+; R12 EU CLP: Annex VI: Flam. Gas 1, H220; Press. Gas - Comp., H280 OSHA HCS 2012:	NDA
Carbon monoxide	CAS:630-08-0 EC Number:211-128-3	0.0005% TO 0.09%	Inhalation-Rat LC50 • 1900 mg/m ³ 4 Hour(s)	WHMIS: EU DSD/DPD: Annex I: F+; R12 T; R23-48/23 Repr.Cat.1; R61 EU CLP: Annex VI: Flam. Gas 1, H220; Press. Gas - Comp., H280; Repr. 1A, H360D; Acute Tox. 3 *, H331; STOT RE 1, H372 OSHA HCS 2012: Flam. Gas 1; Press. Gas - Comp.; Repr. 1A; Acute Tox. 3 (inhl)	NDA
Hydrogen sulfide	CAS:7783-06-4 EC Number:231-977-3	0.0005% TO 0.025%	Inhalation-Rat LC50 • 470 mg/m ³ 6 Hour(s)	EU DSD/DPD: Annex I: F+; R12 T+; R26 N; R50 EU CLP: Annex VI: Flam. Gas 1, H220; Press. Gas - Comp., H280; Acute Tox. 2, H330; Aquatic Acute 1, H400 OSHA HCS 2012: Flam. Gas 1; Press. Gas - Comp.; Acute Tox 2 (inhl)	NDA

Section 4 - First Aid Measures

4.1 Description of first aid measures

- Inhalation**
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. If signs/symptoms continue, get medical attention.
- Skin**
- Although exposure is unlikely, in case of contact immediately flush skin with running water. If skin irritation develops get medical advice/attention.
- Eye**
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
- Ingestion**
- Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to Physician**
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

4.4 Other information

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

Section 5 - Firefighting Measures

5.1 Extinguishing media

- Suitable Extinguishing Media**
- Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.
- Unsuitable Extinguishing Media**
- None known.

5.2 Special hazards arising from the substance or mixture

- Unusual Fire and Explosion Hazards**
- Contains gas under pressure.
Container may explode in a fire or if heated.
Ruptured cylinders may rocket.
- Hazardous Combustion Products**
- None known.

5.3 Advice for firefighters

- Structural firefighters' protective clothing will only provide limited protection. Wear positive pressure self-contained breathing apparatus (SCBA). Move containers from fire area if you can do it without risk.
FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.
FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.
FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices; icing may occur.

FIRE INVOLVING TANKS AND CAR/TRAILER LOADS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions

- Avoid breathing gas. Ventilate the area before entry. In case of insufficient ventilation, wear suitable respiratory equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Emergency Procedures

- Evacuate area. Keep unauthorized personnel away. As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area)

6.2 Environmental precautions

- No special environmental precautions necessary.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Stop leak if you can do it without risk.
Do not direct water at spill or source of leak.
Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed.
Ventilate the area.
Allow substance to evaporate.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Use good safety and industrial hygiene practices. Use only with adequate ventilation. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture, due to oxygen deficiency, could occur without any significant warning symptoms. Cylinders should be firmly secured to prevent falling or being knocked-over. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container. Use suitable hand truck to move cylinders.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Store in a cool, dry, well-ventilated place. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C (70°F)). Do not allow area where cylinders are stored to exceed 52°C (125°F). Cylinders should be firmly secured to prevent falling or being knocked-over. Protect cylinders against physical damage. Store locked up.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines						
	Result	ACGIH	Canada Ontario	Canada Quebec	China	China Highly Toxic Goods
Hydrogen sulfide (7783-06-4)	Ceilings	Not established	Not established	Not established	10 mg/m3 Ceiling [MAC]	10 mg/m3 Ceiling
	STELs	5 ppm STEL	15 ppm STEL	15 ppm STEV; 21 mg/m3 STEV	Not established	Not established
	TWAs	1 ppm TWA	10 ppm TWA	10 ppm TWAEV; 14 mg/m3 TWAEV	Not established	Not established
Carbon monoxide (630-08-0)	Ceilings	Not established	Not established	Not established	20 mg/m3 Ceiling [MAC] (high altitude area, 2000-3000m); 15 mg/m3 Ceiling [MAC] (high altitude area, >3000m)	Not established
	STELs	Not established	100 ppm STEL	200 ppm STEV; 230 mg/m3 STEV	30 mg/m3 STEL (not in high altitude area)	30 mg/m3 STEL (not in high altitude area)
	TWAs	25 ppm TWA	25 ppm TWA	35 ppm TWAEV; 40 mg/m3 TWAEV	20 mg/m3 TWA (not in high altitude area)	20 mg/m3 TWA (not in high altitude area)
Butane (106-97-8)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	800 ppm TWA (listed under Aliphatic hydrocarbon gases)	800 ppm TWAEV; 1900 mg/m3 TWAEV	Not established	Not established
Exposure Limits/Guidelines (Con't.)						
	Result	France	Germany DFG	Germany TRGS	Israel	NIOSH
Hydrogen sulfide (7783-06-4)	STELs	10 ppm STEL [VLCT]; 14 mg/m3 STEL [VLCT]	Not established	Not established	5 ppm STEL	Not established
	TWAs	5 ppm TWA [VME]; 7 mg/m3 TWA [VME]	Not established	5 ppm TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2); 7.1 mg/m3 TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2)	10 ppm TWA	Not established
	Ceilings	Not established	10 ppm Peak; 14.2 mg/m3 Peak	Not established	Not established	10 ppm Ceiling (10 min); 15 mg/m3 Ceiling (10 min)
	MAKs	Not established	5 ppm TWA MAK; 7.1 mg/m3 TWA MAK	Not established	Not established	Not established
				30 ppm TWA AGW (The risk of damage to the embryo or fetus cannot be excluded even when		

Carbon monoxide (630-08-0)	TWAs	50 ppm TWA [VME]; 55 mg/m ³ TWA [VME]	Not established	AGW and BGW values are observed, exposure factor 1); 35 mg/m ³ TWA AGW (The risk of damage to the embryo or fetus cannot be excluded even when AGW and BGW values are observed, exposure factor 1)	25 ppm TWA	35 ppm TWA; 40 mg/m ³ TWA
	Ceilings	Not established	60 ppm Peak; 70 mg/m ³ Peak	Not established	Not established	200 ppm Ceiling; 229 mg/m ³ Ceiling
	MAKs	Not established	30 ppm TWA MAK; 35 mg/m ³ TWA MAK	Not established	Not established	Not established
Butane (106-97-8)	TWAs	800 ppm TWA [VME]; 1900 mg/m ³ TWA [VME]	Not established	1000 ppm TWA AGW (exposure factor 4); 2400 mg/m ³ TWA AGW (exposure factor 4)	1000 ppm TWA (gas)	800 ppm TWA; 1900 mg/m ³ TWA
	Ceilings	Not established	4000 ppm Peak (listed under Butane); 9600 mg/m ³ Peak (listed under Butane)	Not established	Not established	Not established
	MAKs	Not established	1000 ppm TWA MAK; 2400 mg/m ³ TWA MAK	Not established	Not established	Not established

Exposure Limits/Guidelines (Con't.)

	Result	OSHA	Portugal	Spain
Hydrogen sulfide (7783-06-4)	STELs	Not established	15 ppm STEL [VLE-CD]	10 ppm STEL [VLA-EC]; 14 mg/m ³ STEL [VLA-EC]
	TWAs	Not established	10 ppm TWA [VLE-MP]	5 ppm TWA [VLA-ED]; 7 mg/m ³ TWA [VLA-ED]
	Ceilings	20 ppm Ceiling	Not established	Not established
Carbon monoxide (630-08-0)	TWAs	50 ppm TWA; 55 mg/m ³ TWA	25 ppm TWA [VLE-MP]	25 ppm TWA [VLA-ED]; 29 mg/m ³ TWA [VLA-ED]
	Biological Limit Values (BLV)	Not established	Not established	3.5 % of Carboxyhemoglobin in total hemoglobin blood end of shift Carboxyhemoglobin (2,F,I); 20 ppm alveolar air end of shift CO end-cut of exhaled air (2,F,I)
Butane (106-97-8)	TWAs	Not established	Not established	1000 ppm TWA [VLA-ED]

8.2 Exposure controls**Engineering Measures/Controls**

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits.

If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory

- Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear safety glasses.

Skin/Body

- Wear leather gloves when handling cylinders.

Environmental Exposure Controls

- Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

TWAEV = Time-Weighted Average Exposure Value

MAC = Maximum Allowable Concentration

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

MAK = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration

VLA-ED = Valor Límite Ambiental Exposición Diaria is the limit for the daily average concentration

NIOSH = National Institute of Occupational Safety and Health

VME = Valeur Moyenne d'Exposition is the maximum permissible concentration for a work day

OSHA = Occupational Safety and Health Administration

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Gas	Appearance/Description	Colorless compressed gas with a rotten egg-like odor.
Color	Colorless	Odor	Rotten egg-like.
Odor Threshold	Data lacking		
General Properties			
Boiling Point	-196 C(-320.8 F) Nitrogen	Melting Point	-210 C(-346 F) Nitrogen
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	0.967 Water=1 Nitrogen	Water Solubility	Data lacking
Viscosity	Data lacking	Explosive Properties	Not explosive.
Oxidizing Properties:	Not an oxidizer.		
Volatility			
Vapor Pressure	Data lacking	Vapor Density	0.97 Air=1 Nitrogen
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	Data lacking
Flammability (solid, gas)	Not flammable.		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Hazardous polymerization will not occur.

10.4 Conditions to avoid

- Excess heat.

10.5 Incompatible materials

- None known.

10.6 Hazardous decomposition products

- None known.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Component Name	CAS	Data
Oxygen (0.0005% TO 23.5%)	7782-44-7	Reproductive: ihl-rat TCLo:10 pph/9H (22D preg)
Butane (0.0005% TO 1%)	106-97-8	Acute Toxicity: ihl-rat LC50:658 gm/m3/4H
Carbon monoxide (0.0005% TO 0.09%)	630-08-0	Acute Toxicity: ihl-rat LC50:1807 ppm/4H; Reproductive: ihl-rat TCLo:150 ppm (1-20D preg)
Hydrogen sulfide (0.0005% TO 0.025%)	7783-06-4	Acute Toxicity: ihl-rat LC50:700 mg/m3/4H; Irritation: eye-hmn 0.000125 ppm/5H; Reproductive: ihl-rat TCLo:10 mg/m3 (48D pre/1-22D preg)

GHS Properties	Classification
Acute toxicity	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Aspiration Hazard	EU/CLP • Not relevant OSHA HCS 2012 • Classification criteria not met
Carcinogenicity	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Germ Cell Mutagenicity	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Skin corrosion/Irritation	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Skin sensitization	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
STOT-RE	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met

STOT-SE	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Toxicity for Reproduction	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Respiratory sensitization	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Serious eye damage/Irritation	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met

Route(s) of entry/exposure • Inhalation, Skin, Eye and Ingestion

Potential Health Effects

Inhalation

Acute (Immediate)

- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

Chronic (Delayed)

- No data available

Skin

Acute (Immediate)

- Under normal conditions of use, no health effects are expected.

Chronic (Delayed)

- No data available

Eye

Acute (Immediate)

- Under normal conditions of use, no health effects are expected.

Chronic (Delayed)

- No data available

Ingestion

Acute (Immediate)

- Under normal conditions of use, no health effects are expected.

Chronic (Delayed)

- No data available

Carcinogenic Effects

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

Key to abbreviations

TC = Toxic Concentration

LC = Lethal Concentration

Section 12 - Ecological Information

12.1 Toxicity

Oxygen (0.0005–23.5%), Carbon monoxide (0.0005 - 0.09%), Hydrogen Sulfide (0.0005 - 0.025%), Butane (0.0005 - 1.0%), Nitrogen (Balance)					
Dosage	Species	Duration	Results	Exposure Conditions	Comments
= 0.047 mg/L	Fish: Bluegill	96 Hour(s)	LC50	NDA	Data for Hydrogen Sulfide

= 0.019 mg/L	Fish: Bluegill	96 Hour(s)	LC50	NDA	Data for Hydrogen Sulfide
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12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- PBT and vPvB assessment has not been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1956	Compressed gas, n.o.s (Nitrogen, Oxygen)	2.2	NDA	NDA
TDG	UN1956	COMPRESSED GAS, N.O.S. (Nitrogen, Oxygen)	2.2	NDA	NDA
IMO/IMDG	UN1956	COMPRESSED GAS, N.O.S. (Nitrogen, Oxygen)	2.2	NDA	NDA
IATA/ICAO	UN1956	Compressed gas, n.o.s (Nitrogen, Oxygen)	2.2	NDA	NDA

14.6 Special precautions for user

- 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.

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

- Not relevant.

14.8 Other information

- DOT** • Hydrogen Sulfide H₂S has a reportable quantity of 100 lbs (45.4 kg) as listed in Appendix A to 49 CFR 172.101.

Section 15 - Regulatory Information

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

SARA Hazard Classifications • Acute, Pressure(Sudden Release of)

State Right To Know				
Component	CAS	MA	NJ	PA
Nitrogen	7727-37-9	Yes	Yes	Yes
Oxygen	7782-44-7	Yes	Yes	Yes
Butane	106-97-8	Yes	Yes	Yes
Carbon monoxide	630-08-0	Yes	Yes	Yes
Hydrogen sulfide	7783-06-4	Yes	Yes	Yes

Inventory						
Component	CAS	Canada DSL	Canada NDSL	China	EU EINECS	EU ELNICS
Nitrogen	7727-37-9	Yes	No	Yes	Yes	No
Oxygen	7782-44-7	Yes	No	Yes	Yes	No
Butane	106-97-8	Yes	No	Yes	Yes	No
Carbon monoxide	630-08-0	Yes	No	Yes	Yes	No
Hydrogen sulfide	7783-06-4	Yes	No	Yes	Yes	No

Inventory (Con't.)		
Component	CAS	TSCA
Nitrogen	7727-37-9	Yes
Oxygen	7782-44-7	Yes
Butane	106-97-8	Yes
Carbon monoxide	630-08-0	Yes
Hydrogen sulfide	7783-06-4	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

- Hydrogen sulfide 7783-06-4 0.0005% TO 0.025% A, B1, D1A, D2B
- Carbon monoxide 630-08-0 0.0005% TO 0.09% A, B1, D1A, D2A
- Oxygen 7782-44-7 0.0005% TO 23.5% A, C
- Butane 106-97-8 0.0005% TO 1% A, B1
- Nitrogen 7727-37-9 75.385% TO 99.998% A

Canada - WHMIS - Ingredient Disclosure List

- Hydrogen sulfide 7783-06-4 0.0005% TO 0.025% 1 %
- Carbon monoxide 630-08-0 0.0005% TO 0.09% 0.1 %

• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	1 %
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Environment**Canada - CEPA - Priority Substances List**

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

China**Environment****China - Ozone Depleting Substances - First Schedule**

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

China - Ozone Depleting Substances - Second Schedule

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

China - Ozone Depleting Substances - Third Schedule

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Other**China - Annex I & II - Controlled Chemicals Lists**

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed

• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

China - Dangerous Goods List

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	UN1053
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	UN1016
• Oxygen	7782-44-7	0.0005% TO 23.5%	UN1072; UN1073
• Butane	106-97-8	0.0005% TO 1%	UN1011
• Nitrogen	7727-37-9	75.385% TO 99.998%	UN1066; UN1977

China - Export Control List - Part I Chemicals

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Europe**Other****EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification**

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	F+; R12 T+; R26 N; R50
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	F+; R12 T; R23-48/23 Repr.Cat.1; R61
• Oxygen	7782-44-7	0.0005% TO 23.5%	O; R8
• Butane	106-97-8	0.0005% TO 1%	F+; R12
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	F+ T+ N R:12-26-50 S:(1/2)-9-16-36-38-45-61
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	F+ T R:61-12-23-48/23 S:53-45
• Oxygen	7782-44-7	0.0005% TO 23.5%	O R:8 S:(2)-17
• Butane	106-97-8	0.0005% TO 1%	F+ R:12 S:(2)-9-16
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	E
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	C
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	S:(1/2)-9-16-36-38-45-61
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	S:53-45
• Oxygen	7782-44-7	0.0005% TO 23.5%	S:(2)-17
• Butane	106-97-8	0.0005% TO 1%	S:(2)-9-16
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Germany**Environment****Germany - TA Luft - Types and Classes**

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	inorganic gas Substance: 5.2.4, Class II
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Germany - Water Classification (VwVwS) - Annex 1

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	ID Number 743, not considered hazardous to water
• Butane	106-97-8	0.0005% TO 1%	ID Number 561, not considered hazardous to water (1,3-Butadiene <0.1%)
• Nitrogen	7727-37-9	75.385% TO 99.998%	ID Number 1351, not considered hazardous to water

Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	ID Number 283, hazard class 2 - hazard to waters
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	ID Number 257, hazard class 1 - low hazard to waters
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Germany - Water Classification (VwVwS) - Annex 3

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
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• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Other

Germany - Specifically Regulated Chemicals in TRGS

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

United Kingdom

Environment

United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	100000 kg
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

United Kingdom - Substances Contained in Dangerous Substances or Preparations

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Other

United Kingdom - Workplace Exposure Limits (WELs) - Substances in Review

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

United Kingdom - The Red List - Dangerous Substances in Water

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed

• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	1500 lb TQ
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	100 lb final RQ; 45.4 kg final RQ
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed

- Nitrogen 7727-37-9 75.385% TO 99.998% Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

- Hydrogen sulfide 7783-06-4 0.0005% TO 0.025% 100 lb EPCRA RQ
- Carbon monoxide 630-08-0 0.0005% TO 0.09% Not Listed
- Oxygen 7782-44-7 0.0005% TO 23.5% Not Listed
- Butane 106-97-8 0.0005% TO 1% Not Listed
- Nitrogen 7727-37-9 75.385% TO 99.998% Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

- Hydrogen sulfide 7783-06-4 0.0005% TO 0.025% 500 lb TPQ
- Carbon monoxide 630-08-0 0.0005% TO 0.09% Not Listed
- Oxygen 7782-44-7 0.0005% TO 23.5% Not Listed
- Butane 106-97-8 0.0005% TO 1% Not Listed
- Nitrogen 7727-37-9 75.385% TO 99.998% Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

- Hydrogen sulfide 7783-06-4 0.0005% TO 0.025% 1.0 % de minimis concentration
- Carbon monoxide 630-08-0 0.0005% TO 0.09% Not Listed
- Oxygen 7782-44-7 0.0005% TO 23.5% Not Listed
- Butane 106-97-8 0.0005% TO 1% Not Listed
- Nitrogen 7727-37-9 75.385% TO 99.998% Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

- Hydrogen sulfide 7783-06-4 0.0005% TO 0.025% Not Listed
- Carbon monoxide 630-08-0 0.0005% TO 0.09% Not Listed
- Oxygen 7782-44-7 0.0005% TO 23.5% Not Listed
- Butane 106-97-8 0.0005% TO 1% Not Listed
- Nitrogen 7727-37-9 75.385% TO 99.998% Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

- Hydrogen sulfide 7783-06-4 0.0005% TO 0.025% Not Listed
- Carbon monoxide 630-08-0 0.0005% TO 0.09% Not Listed
- Oxygen 7782-44-7 0.0005% TO 23.5% Not Listed
- Butane 106-97-8 0.0005% TO 1% Not Listed
- Nitrogen 7727-37-9 75.385% TO 99.998% Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	developmental toxicity, initial date 7/1/89
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

United States - Pennsylvania**Labor****U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List**

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%
• Carbon monoxide	630-08-0	0.0005% TO 0.09%

• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Not Listed
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Not Listed
• Oxygen	7782-44-7	0.0005% TO 23.5%	Not Listed
• Butane	106-97-8	0.0005% TO 1%	Not Listed
• Nitrogen	7727-37-9	75.385% TO 99.998%	Not Listed

United States - Rhode Island

Labor

U.S. - Rhode Island - Hazardous Substance List

• Hydrogen sulfide	7783-06-4	0.0005% TO 0.025%	Toxic; Flammable
• Carbon monoxide	630-08-0	0.0005% TO 0.09%	Toxic
• Oxygen	7782-44-7	0.0005% TO 23.5%	Flammable
• Butane	106-97-8	0.0005% TO 1%	Toxic; Flammable
• Nitrogen	7727-37-9	75.385% TO 99.998%	Flammable

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H220 - Extremely flammable gas
- H270 - May cause or intensify fire; oxidizer
- H330 - Fatal if inhaled
- H331 - Toxic if inhaled
- H360D - May damage the unborn child.
- H372 - Causes damage to organs through prolonged or repeated exposure.
- H400 - Very toxic to aquatic life
- R8 - Contact with combustible material may cause fire.
- R12 - Extremely flammable.
- R23 - Toxic by inhalation.
- R26 - Very toxic by inhalation.
- R48/23 - Toxic: danger of serious damage to health by prolonged exposure through inhalation.
- R50 - Very toxic to aquatic organisms.
- R61 - May cause harm to the unborn child.

Last Revision Date

- 10/May/2013

Preparation Date

- 26/June/2012

Disclaimer/Statement of Liability

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information contained herein relates only to this specific product. If this gas mixture 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.

Key to abbreviations

NDA = No Data Available
