



Safety Data Sheet 50120MSA

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

1.1 Product identifier

Product Name . Non-Flammable Gas Mixture containing Sulfur Dioxide 0.0001%, Hydrogen Sulfide 0.001-0.025%, Pentane 0.0-0.75%, Oxygen 0.0-23.5% in Nitrogen Balance

MSA P/N . 10153806, 10153807, 10153808, 10154996

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

Relevant identified use(s) . Calibration of Monitoring and Research Equipment

1.3 Details of the supplier of the safety data sheet

Manufacturer	. Air Liquide	U.S. Supplier	Mine Safety Appliances Company
	2700 Post Oak Blvd.		100 Cranberry Woods Drive
	Houston, TX 77056		Cranberry Township
	United States		Pennsylvania U.S.A. 16066
	www.us.airliquide.com		1-800-MSA-2222
	sds@airliquide.com		www.msanet.com/prism
	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 Regulation (EC) No 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. According to European Directive 1999/45/EC this preparation is not considered dangerous.

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).

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

Composition				
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive
Oxygen	CAS:7782-44-7 EC Number:231-956-9 EU Index:008-001-00-8	0% TO 23.5%	NDA	EU DSD/DPD: Annex VI, Table 3.2: O R8 EU CLP: Annex VI, Table 3.1: Ox. Gas 1, H270; Press. Gas - Comp., H280 OSHA HCS 2012: Ox. Gas 1; Press. Gas - Comp.
Pentane	CAS:109-66-0 EC Number:203-692-4 EU Index:601-006-00-1	0% TO 0.75%	Inhalation-Rat LC50 • 364 g/m ³ 4 Hour(s) Ingestion/Oral-Rat LD50 • >2000 mg/kg	EU DSD/DPD: Annex VI, Table 3.2: F+ R12 N R51-53 Xn R65 R66 R67 EU CLP: Annex VI, Table 3.1: Flam. Liq. 1, H224; Asp. Tox. 1, H304; STOT SE 3: Narc., H336; Aquatic Chronic 2, H411; EUH066 OSHA HCS 2012: Flam. Liq. 1; Asp Tox. 1; Eye Irrit. 2A; Skin Irrit. 2; STOT SE 3: Narc.
Hydrogen sulfide	CAS:7783-06-4 EC Number:231-977-3 EU Index:016-001-00-4	0.001% TO 0.025%	Inhalation-Rat LC50 • 700 mg/m ³ 4 Hour(s)	EU DSD/DPD: Annex VI, Table 3.2: F+ R12 T+ R26 N R50 EU CLP: Annex VI, Table 3.1: Flam. Gas 1, H220; Press. Gas - Comp., H280; Acute Tox. 2 *H330; Aquatic Acute 1, H400 OSHA HCS 2012: Flam. Gas; Press. Gas - Comp.; Acute Tox. 2 (inhl)
Sulfur dioxide	CAS:7446-09-5 EC Number:231-195-2 EU Index:016-011-00-9	0.0001%	Inhalation-Rat LC50 • 2168 mg/m ³	EU DSD/DPD: Annex VI, Table 3.2: T R23 C R34 EU CLP: Annex VI, Table 3.1: Press. Gas - Comp., H280; Acute Tox. 3 *, H331; Skin Corr. 1B, H314 OSHA HCS 2012: Press. Gas - Comp.; Muta. 2; Acute Tox. 3 (inhl); Repr. 2; Skin Corr. 1B; Eye Dam. 1
Nitrogen	CAS:7727-37-9 EINECS:231-783-9	Balance	NDA	EU DSD/DPD: Not Classified EU CLP: Self Classified: Press. Gas - Comp. H280 OSHA HCS 2012: Press. Gas - Comp.; Simp. Asphyx.

See Section 16 for full text of H-statements and R-phrases.

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. Give artificial respiration if victim is not breathing. 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

- First aid is not expected to be necessary if material is used under ordinary conditions

and as recommended. If irritation develops and persists, get medical 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. A potential health hazard associated with this gas is anoxia.

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 . Use extinguishing agent suitable for type of surrounding fire.

Unsuitable Extinguishing Media . No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards . Containers may explode when heated. Ruptured cylinders may rocket.

Hazardous Combustion Products . No data available

5.3 Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
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: 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 . Ventilate the area before entry. Do not walk through spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Emergency Procedures

- Keep unauthorized personnel away. Keep out of low areas. Stay upwind. Do not direct water at spill or source of leak. **LARGE SPILL:** Consider initial downwind evacuation for at least 500 meters (1/3 mile)

6.2 Environmental precautions

- Prevent spreading of vapors through sewers, ventilation systems and confined areas.

6.3 Methods and material for containment and cleaning up**Containment/Clean-up Measures**

- Stop leak if you can do it without risk.
Ventilate the area.
Isolate area until gas has dispersed.
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.

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 only with adequate ventilation. Ventilate closed spaces before entering. 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 could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. 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.

7.2 Conditions for safe storage, including any incompatibilities**Storage**

- Store in a cool, dry, well-ventilated place. Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over. Do not allow area where cylinders are stored to exceed 52C (125F).

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
Pentane (109-66-0)	STELs	Not established	Not established	Not established	1000 mg/m3 STEL (listed under Pentane (all isomers))	Not established
	TWAs	600 ppm TWA (listed under Pentane, all isomers)	600 ppm TWA	120 ppm TWA EV; 350 mg/m3 TWA EV	500 mg/m3 TWA (listed under Pentane (all isomers))	Not established
Sulfur dioxide (7446-09-5)	STELs	0.25 ppm STEL	5 ppm STEL; 10.4 mg/m3 STEL	5 ppm STEV; 13 mg/m3 STEV	10 mg/m3 STEL	Not established
	TWAs	Not established	2 ppm TWA; 5.2 mg/m3 TWA	2 ppm TWA EV; 5.2 mg/m3 TWA EV	5 mg/m3 TWA	Not established

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
Exposure Limits/Guidelines (Con't.)						
	Result	Europe	France	Germany DFG	Germany TRGS	Ireland
Pentane (109-66-0)	TWAs	1000 ppm TWA; 3000 mg/m3 TWA	1000 ppm TWA [VME] (restrictive limit); 3000 mg/m3 TWA [VME] (restrictive limit)	Not established	1000 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); 3000 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)	1000 ppm TWA; 3000 mg/m3 TWA
	STELs	Not established	Not established	Not established	Not established	750 ppm STEL; 2250 mg/m3 STEL
	Ceilings	Not established	Not established	2000 ppm Peak (listed under Pentane); 6000 mg/m3 Peak (listed under Pentane)	Not established	Not established
	MAKs	Not established	Not established	1000 ppm TWA MAK; 3000 mg/m3 TWA MAK	Not established	Not established
Sulfur dioxide (7446-09-5)	STELs	Not established	5 ppm STEL [VLCT]; 10 mg/m3 STEL [VLCT]	Not established	Not established	1 ppm STEL; 2.6 mg/m3 STEL
	TWAs	Not established	2 ppm TWA [VME]; 5 mg/m3 TWA [VME]	Not established	1 ppm TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 1); 2.5 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 1)	0.5 ppm TWA; 1.3 mg/m3 TWA
				1 ppm Peak (a ceiling value 1 mL/m3 or 2.7 mg/m3 must not be		

	Ceilings	Not established	Not established	exceeded); 2.7 mg/m ³ Peak (a ceiling value 1 mL/m ³ or 2.7 mg/m ³ must not be exceeded)	Not established	Not established
	MAKs	Not established	Not established	1 ppm TWA MAK; 2.7 mg/m ³ TWA MAK	Not established	Not established
Hydrogen sulfide (7783-06-4)	STELs	Not established	10 ppm STEL [VLCT]; 14 mg/m ³ STEL [VLCT]	Not established	Not established	10 ppm STEL; 14 mg/m ³ STEL
	TWAs	Not established	5 ppm TWA [VME]; 7 mg/m ³ 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/m ³ TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, exposure factor 2)	5 ppm TWA; 7 mg/m ³ TWA
	Ceilings	Not established	Not established	10 ppm Peak; 14.2 mg/m ³ Peak	Not established	Not established
	MAKs	Not established	Not established	5 ppm TWA MAK; 7.1 mg/m ³ TWA MAK	Not established	Not established

Exposure Limits/Guidelines (Con't.)

	Result	Israel	Italy	NIOSH	OSHA	OSHA Vacated
Pentane (109-66-0)	TWAs	600 ppm TWA (listed under Pentane, all isomers)	667 ppm TWA; 2000 mg/m ³ TWA	120 ppm TWA; 350 mg/m ³ TWA	1000 ppm TWA; 2950 mg/m ³ TWA	600 ppm TWA; 1800 mg/m ³ TWA
	Ceilings	Not established	Not established	610 ppm Ceiling (15 min); 1800 mg/m ³ Ceiling (15 min)	Not established	Not established
	STELs	Not established	Not established	Not established	Not established	750 ppm STEL; 2250 mg/m ³ STEL
Sulfur dioxide (7446-09-5)	STELs	0.25 ppm STEL	Not established	5 ppm STEL; 13 mg/m ³ STEL	Not established	5 ppm STEL; 15 mg/m ³ STEL
	TWAs	Not established	Not established	2 ppm TWA; 5 mg/m ³ TWA	5 ppm TWA; 13 mg/m ³ TWA	2 ppm TWA; 5 mg/m ³ TWA
Hydrogen sulfide (7783-06-4)	STELs	5 ppm STEL	Not established	Not established	Not established	15 ppm STEL; 21 mg/m ³ STEL
	TWAs	1 ppm TWA	Not established	Not established	Not established	10 ppm TWA; 14 mg/m ³ TWA
	Ceilings	Not established	Not established	10 ppm Ceiling (10 min); 15 mg/m ³ Ceiling (10 min)	20 ppm Ceiling	Not established

Exposure Limits/Guidelines (Con't.)

	Result	Portugal	Spain	Sweden
			1000 ppm TWA [VLA-	

Pentane (109-66-0)	TWAs	600 ppm TWA [VLE-MP]	ED] (indicative limit value); 3000 mg/m ³ TWA [VLA-ED] (indicative limit value)	600 ppm LLV; 1800 mg/m ³ LLV
	STELs	Not established	Not established	750 ppm STV; 2000 mg/m ³ STV
Sulfur dioxide (7446-09-5)	STELs	5 ppm STEL [VLE-CD]	2 ppm STEL [VLA-EC]; 5.28 mg/m ³ STEL [VLA-EC]	Not established
	TWAs	2 ppm TWA [VLE-MP]	1 ppm TWA [VLA-ED] (it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary or biocide compound); 2.64 mg/m ³ TWA [VLA-ED] (it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary or biocide compound)	2 ppm LLV; 5 mg/m ³ LLV
	Ceilings	Not established	Not established	5 ppm CLV; 13 mg/m ³ CLV
Hydrogen sulfide (7783-06-4)	STELs	15 ppm STEL [VLE-CD]	10 ppm STEL [VLA-EC]; 14 mg/m ³ STEL [VLA-EC]	Not established
	TWAs	10 ppm TWA [VLE-MP]	5 ppm TWA [VLA-ED]; 7 mg/m ³ TWA [VLA-ED]	10 ppm LLV; 14 mg/m ³ LLV
	Ceilings	Not established	Not established	15 ppm CLV; 20 mg/m ³ CLV

Exposure Control Notations

Portugal

- Sulfur dioxide (7446-09-5): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen)
- Nitrogen (7727-37-9): **Simple Asphyxiants:** (Simple Asphyxiant)

Ireland

- Nitrogen (7727-37-9): **Simple Asphyxiants:** (Asphyxiant)

Spain

- Nitrogen (7727-37-9): **Simple Asphyxiants:** (simple asphyxiant)

Germany DFG

- Sulfur dioxide (7446-09-5): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)
- Hydrogen sulfide (7783-06-4): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)
- Pentane (109-66-0): **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to)

Exposure Limits Supplemental

Spain

- Sulfur dioxide (7446-09-5): **Under Review:** (0.5 ppm VLA-ED; 1 ppm VLA-EC; it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary o biocide compound)

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

LLV = Limit Level Value is the exposure limit for 8-hour work day
 = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration

MAK = concentration

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

= Short Term Exposure Limits are based on 15-minute exposures

STEL = Short Term Exposure Value

TWAEV = Time-Weighted Average Exposure Value

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

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Gas	Appearance/Description	Colorless gas with rotten egg odor.
Color	Colorless	Odor	Rotten-egg
Odor Threshold	0.13 ppm (Hydrogen Sulfide)		
General Properties			
Boiling Point	-195.8 C(-320.44 F) (Nitrogen)	Melting Point	-210 C(-346 F) (Nitrogen)
Decomposition Temperature	Data lacking	pH	Not relevant
Specific Gravity/Relative Density	0.906 Water=1 (Nitrogen)	Density	0.072 lb(s)/ft ³ @ 0 C(32 F) (Nitrogen)
Water Solubility	Data lacking	Viscosity	Data lacking
Explosive Properties	Data lacking	Oxidizing Properties:	Data lacking
Volatility			
Vapor Pressure	Data lacking	Vapor Density	Data lacking
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Not relevant	UEL	Not relevant
LEL	Not relevant	Autoignition	Data lacking
Flammability (solid, gas)	Nonflammable Gas.		
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

- Titanium will burn in Nitrogen (the main component of this gas mixture). Lithium reacts slowly with Nitrogen at ambient temperatures. Due to the presence of Pentane and Hydrogen Sulfide, this gas mixture may be incompatible with strong oxidizers. Hydrogen Sulfide is corrosive to most metals due to reaction with metals to form metal sulfides. Pentane is incompatible with halogens. The trace Sulfur Dioxide component is incompatible with the following materials: chlorates, fluorine, interhalogens, sodium hydride, sodium, bases, silver azide, barium peroxide, diethyl zinc, nitryl chloride, powdered metals, potassium, acrolein, lithium nitrate and propene, monolithium acetylide-ammonia (lithium acetylene carbide diammino), cesium azide, metal oxides, metal acetylides, and carbide. Although the Sulfur Dioxide component is in low concentration and significant reaction is not expected, caution should be used if contact with this gas mixture and these materials can occur.

10.6 Hazardous decomposition products

- Combustion: Sulfur oxides, carbon oxides. Hydrolysis: Sulfurous acid.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Sulfur dioxide (0.0001%)	7446-09-5	Acute Toxicity: Inhalation-Rat LC50 • 2520 ppm 1 Hour(s); Irritation: Eye-Rabbit • 6 ppm 32 Day(s) • Mild irritation; Mutagen: Cytogenetic analysis • Inhalation-Mouse • 14 µg/L 4 Hour(s) 7 Day(s); Micronucleus test • Inhalation-Mouse • 28 µg/L 5 Day(s)-Intermittent; DNA adduct • Inhalation-Rat • 72 mg/kg 300 Day(s)-Intermittent; Reproductive: Inhalation-Mouse TClO • 25 ppm 7 Hour(s)(6-15D preg); <i>Reproductive Effects:Specific Developmental Abnormalities:</i> Musculoskeletal system ; Inhalation-Rabbit TClO • 70 ppm 7 Hour(s)(6-18D preg); <i>Reproductive Effects:Specific Developmental Abnormalities:</i> Musculoskeletal system
Hydrogen sulfide (0.001% TO 0.025%)	7783-06-4	Acute Toxicity: Inhalation-Rat LC50 • 700 mg/m ³ 4 Hour(s); Irritation: Eye-Human • 0.000125 ppm 5 Hour(s); Reproductive: Inhalation-Rat TClO • 10 mg/m ³ (48D pre/1-22D preg); <i>Reproductive Effects:Effects on Fertility:</i> Pre-implantation mortality ; <i>Reproductive Effects:Effects on Fertility:</i> Post-implantation mortality ; <i>Reproductive Effects:Specific Developmental Abnormalities:</i> Urogenital system
Pentane (0% TO 0.75%)	109-66-0	Acute Toxicity: Ingestion/Oral-Rat LD50 • >2000 mg/kg; Inhalation-Rat LC50 • 364 g/m ³ 4 Hour(s)
Oxygen (0% TO 23.5%)	7782-44-7	Reproductive: Inhalation-Rat TClO • 10 pph 9 Hour(s)(22D preg); <i>Reproductive Effects:Specific Developmental Abnormalities:</i> Respiratory system ; <i>Reproductive Effects:Effects on Newborn:</i> Physical

GHS Properties

Classification

Acute toxicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Aspiration Hazard	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Carcinogenicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Germ Cell Mutagenicity	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Skin corrosion/Irritation	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Skin sensitization	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
STOT-RE	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
STOT-SE	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Toxicity for Reproduction	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Respiratory sensitization	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking
Serious eye damage/Irritation	EU/CLP • Data lacking OSHA HCS 2012 • Data lacking

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)

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

Eye

Acute (Immediate)

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

Chronic (Delayed)

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

Ingestion

Acute (Immediate)

- Ingestion is not anticipated to be a likely route of exposure to this product.

Chronic (Delayed)

- Ingestion is not anticipated to be a likely route of exposure to this product.

Key to abbreviations

LC = Lethal Concentration

LD = Lethal Dose

TC = Toxic Concentration

Section 12 - Ecological Information

12.1 Toxicity

- Material data lacking.

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 for this material.

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 gases, n.o.s. (Nitrogen, Oxygen)	2.2	NDA	NDA
TDG	UN1956	COMPRESSED GASES, N.O.S. (Nitrogen, Oxygen)	2.2	NDA	NDA
IMO/IMDG	UN1956	COMPRESSED GASES, N.O.S. (Nitrogen, Oxygen)	2.2	NDA	NDA
IATA/ICAO	UN1956	Compressed gases, 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

- Data lacking.

Code

Section 15 - Regulatory Information

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

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

State Right To Know				
Component	CAS	MA	NJ	PA
Hydrogen sulfide	7783-06-4	Yes	Yes	Yes
Nitrogen	7727-37-9	Yes	Yes	Yes
Oxygen	7782-44-7	Yes	Yes	Yes
Pentane	109-66-0	Yes	Yes	Yes
Sulfur dioxide	7446-09-5	Yes	Yes	Yes

Inventory						
Component	CAS	Canada DSL	Canada NDSL	China	EU EINECS	EU ELNICS
Hydrogen sulfide	7783-06-4	Yes	No	Yes	Yes	No
Nitrogen	7727-37-9	Yes	No	Yes	Yes	No
Oxygen	7782-44-7	Yes	No	Yes	Yes	No
Pentane	109-66-0	Yes	No	Yes	Yes	No
Sulfur dioxide	7446-09-5	Yes	No	Yes	Yes	No

Inventory (Con't.)		
Component	CAS	TSCA
Hydrogen sulfide	7783-06-4	Yes
Nitrogen	7727-37-9	Yes
Oxygen	7782-44-7	Yes
Pentane	109-66-0	Yes
Sulfur dioxide	7446-09-5	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Hydrogen sulfide	7783-06-4	A, B1, D1A, D2B
• Pentane	109-66-0	B2
• Oxygen	7782-44-7	A, C
• Sulfur dioxide	7446-09-5	A, D1A, D2B, E
• Nitrogen	7727-37-9	A

Canada - WHMIS - Ingredient Disclosure List

• Hydrogen sulfide	7783-06-4	1 %
• Pentane	109-66-0	1 %
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	1 %
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

China - Ozone Depleting Substances - Second Schedule

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

China - Ozone Depleting Substances - Third Schedule

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

China - Dangerous Goods List

• Hydrogen sulfide	7783-06-4	
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	(compressed or refrigerated liquid)
• Sulfur dioxide	7446-09-5	
• Nitrogen	7727-37-9	(compressed or refrigerated liquid)

China - Export Control List - Part I Chemicals

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

Europe

Other

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

• Hydrogen sulfide	7783-06-4	F+; R12 T+; R26 N; R50
• Pentane	109-66-0	F+; R12 N; R51-53 Xn; R65 R66 R67
• Oxygen	7782-44-7	O; R8
• Sulfur dioxide	7446-09-5	T; R23 C; R34
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	20%≤C: T; R:23 5% ≤C<20%: Xn; R:20
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	F+ T+ N R:12-26-50 S:(1/2)-9-16-36-38-45-61
• Pentane	109-66-0	F+ Xn N R:12-51/53-65-66-67 S:(2)-9-16-29-33-61-62
• Oxygen	7782-44-7	O R:8 S:(2)-17
• Sulfur dioxide	7446-09-5	T R:23-34 S:(1/2)-9-26-36/37/39-45
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	C
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	5
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	S:(1/2)-9-16-36-38-45-61
• Pentane	109-66-0	S:(2)-9-16-29-33-61-62
• Oxygen	7782-44-7	S:(2)-17
• Sulfur dioxide	7446-09-5	S:(1/2)-9-26-36/37/39-45
• Nitrogen	7727-37-9	Not Listed

Germany

Environment

Germany - TA Luft - Types and Classes

• Hydrogen sulfide	7783-06-4	inorganic gas Substance: 5.2.4, Class II
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	inorganic gas Substance: 5.2.4, Class IV
• Nitrogen	7727-37-9	Not Listed

Germany - Water Classification (VwVwS) - Annex 1

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	ID Number 743, not considered hazardous to water
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	ID Number 1351, not considered hazardous to water

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

• Hydrogen sulfide	7783-06-4	ID Number 283, hazard class 2 - hazard to waters
• Pentane	109-66-0	ID Number 452, hazard class 2 - hazard to waters
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	ID Number 416, hazard class 1 - low hazard to waters (footnote 8)
• Nitrogen	7727-37-9	Not Listed

Germany - Water Classification (VwVwS) - Annex 3

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

Other**Germany - Specifically Regulated Chemicals in TRGS**

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

Portugal**Other****Portugal - Prohibited Substances**

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

United Kingdom - List of Dangerous Substances in Water

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

United States**Labor****U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals**

• Hydrogen sulfide	7783-06-4	1500 lb TQ
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	1000 lb TQ (liquid)
• Nitrogen	7727-37-9	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	100 lb final RQ; 45.4 kg final RQ
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	100 lb EPCRA RQ
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	500 lb EPCRA RQ
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	500 lb TPQ
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	500 lb TPQ
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	1.0 % de minimis concentration
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261

• Hydrogen sulfide	7783-06-4	waste number U135
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - U Series Wastes - Acutely Toxic Wastes & Other Hazardous Characteristics

• Hydrogen sulfide	7783-06-4	waste number U135
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

United States - California**Environment****U.S. - California - Proposition 65 - Carcinogens List**

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	developmental toxicity, initial date 7/29/11
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	
• Nitrogen	7727-37-9	Not Listed

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

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Oxygen	7782-44-7	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Nitrogen	7727-37-9	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

15.3 Other Information

- WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H220 - Extremely flammable gas
- H224 - Extremely flammable liquid and vapour
- H270 - May cause or intensify fire; oxidizer
- H304 - May be fatal if swallowed and enters airways
- H314 - Causes severe skin burns and eye damage.
- H330 - Fatal if inhaled
- H331 - Toxic if inhaled
- 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.
- R34 - Causes burns.
- R50 - Very toxic to aquatic organisms.
- R51 - Toxic to aquatic organisms.
- R53 - May cause long-term adverse effects in the aquatic environment.
- R65 - Harmful: may cause lung damage if swallowed.
- R66 - Repeated exposure may cause skin dryness or cracking.
- R67 - Vapours may cause drowsiness and dizziness.

Last Revision Date

- 17/October/2014

Preparation Date

- 17/October/2014

Disclaimer/Statement of Liability

- To the best of Air Liquide's 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 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