

Safety Data Sheet



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

1.1 Product identifier

Product Name • Carbon Dioxide (< 23%), Nitric Oxide (< 1%), Sulfur Dioxide (< 1%), Nitrogen (Balance)

Product Code • 90112

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 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 • Irritant (Xi)
R36/37/38

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 • R36/37/38 - Irritating to eyes, respiratory system and skin.

Safety phrases • S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

2.3 Other Hazards

CLP

- This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. Inhalation of carbon dioxide can increase respiration and heart rate. 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. Inhalation of carbon dioxide can increase respiration and heart rate. According to European Directive 1999/45/EC this preparation is 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
 - Reproductive Toxicity 2 - H361
 - Simple Asphyxiant

2.2 Label elements

OSHA HCS 2012

WARNING



- Hazard statements** • Contains gas under pressure; may explode if heated - H280
Suspected of damaging fertility or the unborn child. - H361
May displace oxygen and cause rapid suffocation.

Precautionary statements

- Prevention** • Obtain special instructions before use. - P201
Do not handle until all safety precautions have been read and understood. - P202
Wear protective gloves/protective clothing/eye protection/face protection. - P280

- Response** • IF exposed or concerned: Get medical advice/attention. - P308+P313

- Storage/Disposal** • Store in a well-ventilated place. - P403
Store locked up. - P405
Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. - P501

2.3 Other hazards

- OSHA HCS 2012**
- Inhalation of carbon dioxide can increase respiration and heart rate. 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. Inhalation of carbon dioxide can increase respiration and heart rate. In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

2.4 Other information

NFPA



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
Carbon dioxide	CAS:124-38-9 EC Number:204-696-9	< 23%	Inhalation-Rat LC50 • 470000 ppm 30 Minute(s)	EU DSD/DPD: Not Classified EU CLP: Self Classified: Press. Gas - Comp., H280 OSHA HCS 2012: Press. Gas - Comp.; Simp. Asphyx.
Sulfur dioxide	CAS:7446-09-5 EC Number:231-195-2	< 0.1%	Inhalation-Rat LC50 • 2168 mg/m ³	EU DSD/DPD: Annex I: T; R23 C; R34 EU CLP: Annex VI: Press. Gas - Comp., H280; Acute Tox. 3, H331; Skin Corr. 1B, H314 OSHA HCS 2012: Press. Gas - Comp.; Muta. 2; Acute Tox. 3 (Inhalation); Repr. 2; Skin Corr. 1B; Eye Dam. 1
				EU DSD/DPD: Self Classified: O, R8, T+ R26, C, R34 EU CLP: Self Classified: Press Gas - Comp., H280; Ox. Gas 1, H270;

Nitric oxide	CAS:10102-43-9 EINECS:233-271-0	< 0.1%	Inhalation-Rat LC50 • 160 mg/m ³	Acute Tox. 1, H332; Skin Corr. 1A, H314; Eye Dam. 1, H318; STOT SE 1 (Lung, Bood (Methemoglobin former)), H370 OSHA HCS 2012: Press. Gas - Comp.; Ox. Gas 1; Acute Tox. 1 (Inhalation); Skin Corr. 1; Eye Dam. 1; STOT SE 1 (Lung, Bood (Methemoglobin former))
Nitrogen	CAS:7727-37-9 EINECS:231-783-9	Balance	NDA	EU DSD/DPD: None EU CLP: Self Classified: Press. Gas - Comp., H280 OSHA HCS 2012: Press. Gas - Comp.; Simp. Asphyx.

See Section 11 for Toxicological Information. 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 • None known.

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.

Always wear thermal protective clothing when handling refrigerated/cryogenic liquids. 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

- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not touch or walk through spilled material. Ventilate the area before entry.

Emergency Procedures

- Stop leak if you can do it without risk. 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.
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.

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. Wear appropriate personal protective equipment, avoid direct contact. 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.

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	Europe
Nitric oxide (10102-43-9)	STELs	Not established	Not established	Not established	30 mg/m3 STEL	Not established
	TWAs	25 ppm TWA	25 ppm TWA	25 ppm TWAEV; 31 mg/m3 TWAEV	15 mg/m3 TWA	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 TWAEV; 5.2 mg/m3 TWAEV	5 mg/m3 TWA	Not established
Carbon dioxide (124-38-9)	TWAs	5000 ppm TWA	5000 ppm TWA	5000 ppm TWAEV; 9000 mg/m3 TWAEV	9000 mg/m3 TWA	5000 ppm TWA; 9000 mg/m3 TWA
	STELs	30000 ppm STEL	30000 ppm STEL	30000 ppm STEV; 54000 mg/m3 STEV	18000 mg/m3 STEL	Not established
Exposure Limits/Guidelines (Con't.)						
	Result	France	Germany DFG	Germany TRGS	Ireland	Israel
Nitric oxide (10102-43-9)	TWAs	25 ppm TWA [VME]; 30 mg/m3 TWA [VME]	Not established	Not established	25 ppm TWA; 30 mg/m3 TWA	25 ppm TWA
	STELs	Not established	Not established	Not established	35 ppm STEL; 45 mg/m3 STEL	Not established
	Ceilings	Not established	1 ppm Peak; 1.26 mg/m3 Peak	Not established	Not established	Not established
	MAKs	Not established	0.5 ppm TWA MAK; 0.63 mg/m3 TWA MAK	Not established	Not established	Not established
Sulfur dioxide (7446-09-5)	STELs	5 ppm STEL [VLCT]; 10 mg/m3 STEL [VLCT]	Not established	Not established	1 ppm STEL; 2.6 mg/m3 STEL	0.25 ppm STEL
	TWAs	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	Not established
	Ceilings	Not established	1 ppm Peak (a ceiling value 1 mL/m3 or 2.7 mg/m3 must not be exceeded); 2.7 mg/m3 Peak (a ceiling	Not established	Not established	Not established

			value 1 mL/m3 or 2.7 mg/m3 must not be exceeded)			
	MAKs	Not established	1 ppm TWA MAK; 2.7 mg/m3 TWA MAK	Not established	Not established	Not established
Carbon dioxide (124-38-9)	TWAs	5000 ppm TWA [VME] (indicative limit); 9000 mg/m3 TWA [VME] (indicative limit)	Not established	5000 ppm TWA AGW (exposure factor 2); 9100 mg/m3 TWA AGW (exposure factor 2)	5000 ppm TWA; 9000 mg/m3 TWA	5000 ppm TWA
	STELs	Not established	Not established	Not established	Not established	30000 ppm STEL
	Ceilings	Not established	10000 ppm Peak; 18200 mg/m3 Peak	Not established	Not established	Not established
	MAKs	Not established	5000 ppm TWA MAK; 9100 mg/m3 TWA MAK	Not established	Not established	Not established

Exposure Limits/Guidelines (Con't.)

	Result	Italy	NIOSH	OSHA	Portugal	Spain
Nitric oxide (10102-43-9)	TWAs	Not established	25 ppm TWA; 30 mg/m3 TWA	25 ppm TWA; 30 mg/m3 TWA	25 ppm TWA [VLE-MP]	25 ppm TWA [VLA-ED]; 31 mg/m3 TWA [VLA-ED]
Sulfur dioxide (7446-09-5)	STELs	Not established	5 ppm STEL; 13 mg/m3 STEL	Not established	5 ppm STEL [VLE-CD]	2 ppm STEL [VLA-EC]; 5.28 mg/m3 STEL [VLA-EC]
	TWAs	Not established	2 ppm TWA; 5 mg/m3 TWA	5 ppm TWA; 13 mg/m3 TWA	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/m3 TWA [VLA-ED] (it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary or biocide compound)
Carbon dioxide (124-38-9)	STELs	Not established	30000 ppm STEL; 54000 mg/m3 STEL	Not established	30000 ppm STEL [VLE-CD]	Not established
	TWAs	5000 ppm TWA; 9000 mg/m3 TWA	5000 ppm TWA; 9000 mg/m3 TWA	5000 ppm TWA; 9000 mg/m3 TWA	5000 ppm TWA [VLE-MP]	5000 ppm TWA [VLA-ED] (indicative limit value); 9150 mg/m3 TWA [VLA-ED] (indicative limit value)

Exposure Limits/Guidelines (Con't.)

	Result	Sweden
Nitric oxide (10102-43-9)	STELs	50 ppm STV; 60 mg/m3 STV
	TWAs	25 ppm LLV; 30 mg/m3 LLV
Sulfur dioxide	Ceilings	5 ppm CLV; 13 mg/m3 CLV

(7446-09-5)	TWAs	2 ppm LLV; 5 mg/m3 LLV
Carbon dioxide (124-38-9)	STELs	10000 ppm STV; 18000 mg/m3 STV
	TWAs	5000 ppm LLV; 9000 mg/m3 LLV

Exposure Control Notations

Portugal

•Sulfur dioxide (7446-09-5): **Carcinogens:** (A4 - Not Classifiable as a Human Carcinogen) | **Simple Asphyxiants:** (Simple Asphyxiant)

Ireland

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

Spain

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

Germany DFG

•Nitric oxide (10102-43-9): **Pregnancy:** (classification not yet possible) | **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

MAK = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

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

STEV = Short Term Exposure Value

TWAEV = Time-Weighted Average Exposure Value

TWA = 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 irritating pungent odor.

Color	Colorless	Odor	Irritating pungent odor.
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	Not relevant
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

10.6 Hazardous decomposition products

- Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Component Name	CAS	Data
Carbon dioxide (< 23%)	124-38-9	Acute Toxicity: ihl-rat LC50:470000 ppm/30M; Reproductive: ihl-rat TCLo:6 ppH/24H (10D preg)

Nitric oxide (< 0.1%)	10102-43-9	Acute Toxicity: ihl-rat LC50:160 mg/m3; Mutagen: msc-rat-ihl 27 ppm/3H-C
Sulfur dioxide (< 0.1%)	7446-09-5	Acute Toxicity: ihl-rat LC50:2520 ppm/1H; Irritation: eye-rbt 6 ppm/32D MLD; Mutagen: dna-rat-ihl 72 mg/kg/300D-I; Reproductive: ihl-mus TClO:25 ppm/7H (6-15D preg)

GHS Properties	Classification
Acute toxicity	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Aspiration Hazard	EU/CLP • Classification criteria not met 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 • Toxic to Reproduction 2
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

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)**

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

Chronic (Delayed)

- No data available

Reproductive Effects

- Based on studies in mice and rabbits, sulfur dioxide may cause developmental effects.

Key to abbreviations

LC = Lethal Concentration

TC = Toxic Concentration

Section 12 - Ecological Information**12.1 Toxicity**

- This gas mixture does not present a hazard of toxicity to the environment.

12.2 Persistence and degradability

- This gas mixture does not present a hazard of persistence and does not biodegrade as it contains elemental gases.

12.3 Bioaccumulative potential

- This gas mixture does not present a hazard of bio-accumulation.

12.4 Mobility in Soil

- This gas mixture does not present a hazard of mobility in the soil.

12.5 Results of PBT and vPvB assessment

- PBT and vPvB assessment has not been conducted for this material.

12.6 Other adverse effects

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

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, Carbon Dioxide)	2.2	NDA	NDA
TDG	UN1956	COMPRESSED GAS, N.O.S. (Nitrogen, Carbon Dioxide)	2.2	NDA	Potential Marine Pollutant
IMO/IMDG	UN1956	COMPRESSED GAS, N.O.S. (Nitrogen, Carbon Dioxide)	2.2	NDA	NDA

IATA/ICAO	UN1956	Compressed gas, n.o.s. (Nitrogen, Carbon Dioxide)	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.

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
Carbon dioxide	124-38-9	Yes	Yes	Yes
Nitrogen	7727-37-9	Yes	Yes	Yes
Nitric oxide	10102-43-9	Yes	Yes	Yes
Sulfur dioxide	7446-09-5	Yes	Yes	Yes

Inventory						
Component	CAS	Canada DSL	Canada NDSL	China	EU EINECS	EU ELNICS
Carbon dioxide	124-38-9	Yes	No	Yes	Yes	No
Nitrogen	7727-37-9	Yes	No	Yes	Yes	No
Nitric oxide	10102-43-9	Yes	No	Yes	Yes	No
Sulfur dioxide	7446-09-5	Yes	No	Yes	Yes	No

Inventory (Con't.)		
Component	CAS	TSCA
Carbon dioxide	124-38-9	Yes
Nitrogen	7727-37-9	Yes
Nitric oxide	10102-43-9	Yes
Sulfur dioxide	7446-09-5	Yes

Canada**Labor****Canada - WHMIS - Classifications of Substances**

• Nitric oxide	10102-43-9	A, C, D1A, E
• Sulfur dioxide	7446-09-5	A, D1A, D2B, E
• Carbon dioxide	124-38-9	A; Uncontrolled product according to WHMIS classification criteria (solid)
• Nitrogen	7727-37-9	A

Canada - WHMIS - Ingredient Disclosure List

• Nitric oxide	10102-43-9	1 %
• Sulfur dioxide	7446-09-5	1 %
• Carbon dioxide	124-38-9	1 %
• Nitrogen	7727-37-9	Not Listed

Environment

Canada - 2004 NPRI (National Pollutant Release Inventory)

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Part 4 Substance
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Canada - 2005 NPRI (National Pollutant Release Inventory)

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Part 4 Substance
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Canada - CEPA - Greenhouse Gases Subject to Mandatory Reporting

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	1 GWP
• Nitrogen	7727-37-9	Not Listed

Canada - CEPA - Priority Substances List

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Canada - DWQ (Drinking Water Quality) - IMACs

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Other

Canada - Accelerated Reduction/Elimination of Toxics (ARET)

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Canada New Brunswick

Environment

Canada - New Brunswick - Ozone Depleting Substances - Schedule A

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Canada - New Brunswick - Ozone Depleting Substances - Schedule B

• Nitric oxide	10102-43-9	Not Listed
----------------	------------	------------

• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

China

Environment

China - Ozone Depleting Substances - First Schedule

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

China - Ozone Depleting Substances - Second Schedule

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

China - Ozone Depleting Substances - Third Schedule

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Other

China - Annex I & II - Controlled Chemicals Lists

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

China - Dangerous Goods List

• Nitric oxide	10102-43-9	
• Sulfur dioxide	7446-09-5	
• Carbon dioxide	124-38-9	(including solid or refrigerated liquid)
• Nitrogen	7727-37-9	(compressed or refrigerated liquid)

China - Export Control List - Part I Chemicals

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Europe

Other

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	T; R23 C; R34
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	20%≤C: T; R:23 5% ≤C<20%: Xn; R:20
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	T R:23-34 S:(1/2)-9-26-36/37/39-45
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	5
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	S:(1/2)-9-26-36/37/39-45
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	inorganic gas Substance: 5.2.4, Class IV
• Sulfur dioxide	7446-09-5	inorganic gas Substance: 5.2.4, Class IV
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Germany - Water Classification (VwVwS) - Annex 1

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	ID Number 256, not considered hazardous to water
• Nitrogen	7727-37-9	ID Number 1351, not considered hazardous to water

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

• Nitric oxide	10102-43-9	ID Number 285, hazard class 1 - low hazard to waters
• Sulfur dioxide	7446-09-5	ID Number 416, hazard class 1 - low hazard to waters (footnote 8)
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

Germany - Water Classification (VwVwS) - Annex 3

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	10000000 kg (qualifying renewable fuel sources are reportable when the total amount of CO2 released is above 10 million kg); 10000000 kg
• Nitrogen	7727-37-9	Not Listed

United Kingdom - Substances Contained in Dangerous Substances or Preparations

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

United Kingdom - List of Dangerous Substances in Water

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

United States

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

• Nitric oxide	10102-43-9	250 lb TQ
• Sulfur dioxide	7446-09-5	1000 lb TQ (liquid)
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	10 lb final RQ (releases to the air in amounts <1000 pounds per 24 hours which are the result of combustion and combustion-related activities are exempt from the notification requirements per 40 CFR 302.6); 4.54 kg final RQ (releases to the air in amounts <1000 pounds per 24 hours which are the result of combustion and combustion-related activities are exempt from the notification requirements per 40 CFR 302.6)
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	10 lb EPCRA RQ (Releases to the air in amounts <1000 pounds per 24 hours which are the result of combustion and combustion-related activities are exempt from the notification requirements per 40 CFR 355.31)
----------------	------------	--

• Sulfur dioxide	7446-09-5	500 lb EPCRA RQ
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	100 lb TPQ
• Sulfur dioxide	7446-09-5	500 lb TPQ
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	waste number P076
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	waste number P076
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	developmental toxicity, initial date 7/29/11
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	
• Sulfur dioxide	7446-09-5	
• Carbon dioxide	124-38-9	Not Listed
• Nitrogen	7727-37-9	Not Listed

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

• Nitric oxide	10102-43-9	Not Listed
• Sulfur dioxide	7446-09-5	Not Listed
• Carbon dioxide	124-38-9	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
H270 - May cause or intensify fire; oxidizer
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H330 - Fatal if inhaled
H331 - Toxic if inhaled
H360D - May damage the unborn child.
H370 - Causes damage to organs.
H372 - Causes damage to organs through prolonged or repeated exposure.
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.
R61 - May cause harm to the unborn child.

Last Revision Date

- 17/January/2014

Preparation Date

- 17/January/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