



# Halocarbon-23 (0.0001% - 20.0000%), Carbon Dioxide (3.0000% - 60.4999%), Nitrous Oxide (20.0000% - 77.4999%) in Oxygen

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 04/03/2015

Version: 2.0

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form : Mixture  
Product name : Halocarbon-23 (0.0001% - 20.0000%), Carbon Dioxide (3.0000% - 60.4999%), Nitrous Oxide (20.0000% - 77.4999%) in Oxygen  
Product code : HC-2004-03420

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

Use of the substance/mixture : Test gas/Calibration gas.

#### 1.3. Details of the supplier of the safety data sheet

Air Liquide  
2700 Post Oak Boulevard  
Houston, TX 77056 - USA  
T 1-800-819-1704  
[www.us.airliquide.com](http://www.us.airliquide.com)

#### 1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification (GHS-US)

Ox. Gas 1	H270
Compressed gas	H280
STOT SE 3	H336

Full text of H-phrases: see section 16

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :

- H270 - May cause or intensify fire; oxidizer
- H280 - Contains gas under pressure; may explode if heated
- H336 - May cause drowsiness or dizziness
- OSHA-H01 - May displace oxygen and cause rapid suffocation
- CGA-HG03 - May increase respiration and heart rate

Precautionary statements (GHS-US) :

- P202 - Do not handle until all safety precautions have been read and understood
- P220 - Keep/Store away from combustible materials, clothing
- P244 - Keep reduction valves/valves and fittings free from oil and grease
- P261 - Avoid breathing gas
- P271 - Use only outdoors or in a well-ventilated area
- P280 - Wear eye protection, face protection, protective gloves, protective clothing
- P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
- P308+P313 - If exposed or concerned: Get medical advice/attention
- P403 - Store in a well-ventilated place
- P405 - Store locked up
- P501 - Dispose of contents/container in accordance with local/regional/national/international regulations
- CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)
- CGA-PG05 - Use a back flow preventive device in the piping
- CGA-PG06 - Close valve after each use and when empty
- CGA-PG10 - Use only with equipment rated for cylinder pressure

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## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

CGA-PG14 - Approach suspected leak area with caution  
CGA-PG20 - Use only with equipment of compatible materials of construction  
CGA-PG21 - Open valve slowly  
CGA-PG22 - Use only with equipment cleaned for oxygen service

### 2.3. Other hazards

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product identifier	%	Classification (GHS-US)
Nitrous oxide	(CAS No) 10024-97-2	20 - 77.4999	Ox. Gas 1, H270 Liquefied gas, H280 STOT SE 3, H336
Oxygen	(CAS No) 7782-44-7	19.5 - 76.9999	Ox. Gas 1, H270 Compressed gas, H280
Carbon dioxide	(CAS No) 124-38-9	3 - 60.4999	Liquefied gas, H280
Trifluoromethane (R23)	(CAS No) 75-46-7	0.0001 - 20	Liquefied gas, H280

Full text of H-phrases: see section 16

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Adverse effects not expected from this product.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness. May increase respiration and heart rate.

Symptoms/injuries after skin contact : Adverse effects not expected from this product.

Symptoms/injuries after eye contact : Adverse effects not expected from this product.

Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.

Symptoms/injuries upon intravenous administration : Not known.

Chronic symptoms : Adverse effects not expected from this product.

### 4.3. Indication of any immediate medical attention and special treatment needed

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : Do not use water jet to extinguish.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : The product is not flammable.

Explosion hazard : Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity : None known.

### 5.3. Advice for firefighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

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## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Protection during firefighting : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ensure adequate ventilation.

##### 6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment consistent with the site emergency plan.

Emergency procedures : Escape the danger area by the closest safe route. Close doors and windows of adjacent premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep upwind.

##### 6.1.2. For emergency responders

Protective equipment : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.

Emergency procedures : Evacuate and limit access. Ventilate area.

#### 6.2. Environmental precautions

Try to stop release if safe to do so.

#### 6.3. Methods and material for containment and cleaning up

For containment : Try to stop release if safe to do so.

Methods for cleaning up : Dispose of this material and its container in accordance with local regulations.

#### 6.4. Reference to other sections

See also Sections 8 and 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Additional hazards when processed : Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure. Close valve after each use and when empty.

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.

Hygiene measures : Do not eat, drink or smoke when using this product.

#### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Comply with applicable regulations.

Storage conditions : Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use. Protect cylinder from physical damage. Store in well ventilated area. Store locked up.

Incompatible products : None known.

Incompatible materials : Flammable materials. Combustible materials. Reducing agents.

#### 7.3. Specific end use(s)

See Section 1.2.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

Halocarbon-23 (0.0001% - 20.0000%), Carbon Dioxide (3.0000% - 60.4999%), Nitrous Oxide (20.0000% - 77.4999%) in Oxygen		
ACGIH	Not applicable	
OSHA	Not applicable	
Trifluoromethane (R23) (75-46-7)		
ACGIH	Not applicable	
OSHA	Not applicable	
Carbon dioxide (124-38-9)		
ACGIH	ACGIH TWA (ppm)	5000 ppm
ACGIH	ACGIH STEL (ppm)	30000 ppm

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## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Carbon dioxide (124-38-9)		
OSHA	OSHA PEL (TWA) (mg/m³)	9000 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	5000 ppm
Nitrous oxide (10024-97-2)		
ACGIH	ACGIH TWA (ppm)	50 ppm
OSHA	Not applicable	
Oxygen (7782-44-7)		
ACGIH	Not applicable	
OSHA	Not applicable	

### 8.2. Exposure controls

Appropriate engineering controls	: Ensure exposure is below occupational exposure limits. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Consider work permit system e.g. for maintenance activities.
Hand protection	: Wear working gloves when handling gas containers. 29 CFR 1910.138: Hand Protection.
Eye protection	: Wear safety glasses with side shields. 29 CFR 1910.133: Eye and Face Protection.
Skin and body protection	: Wear suitable protective clothing, e.g. - lab coats, coveralls or flame resistant clothing.
Respiratory protection	: None necessary during normal and routine operations. See Sections 5 & 6.
Thermal hazard protection	: None necessary during normal and routine operations.
Environmental exposure controls	: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
Other information	: Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Clear, colorless gas.
Color	: Colorless
Odor	: Slightly sweet
Odor threshold	: No Data Available
pH	: No data available
Melting point	: No Data Available
Freezing point	: No data available
Boiling point	: No Data Available
Flash point	: No Data Available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: See Section 2.1 and 2.2
Explosion limits	: Not applicable - not flammable
Explosive properties	: Not applicable - not flammable.
Oxidizing properties	: Not combustible but enhances combustion of other substances. May cause or intensify fire; oxidizer.
Vapor pressure	: No data available
Relative density	: No data available
Relative vapor density at 20 °C	: No data available
Molecular mass	: Not applicable for gas-mixtures.
Relative gas density	: Heavier than air
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available

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## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Viscosity	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available

### 9.2. Other information

Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
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## SECTION 10: Stability and reactivity

### 10.1. Reactivity

None known.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

May react violently with reducing agents. Can form explosive mixtures with flammable materials.

### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

### 10.5. Incompatible materials

Combustible materials. Flammable materials. Reducing agents.

### 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

Acute toxicity	: Not classified
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Trifluoromethane (R23) (75-46-7)	
LC50 inhalation rat (ppm)	663000 ppm/4h
ATE US (gases)	663000.000 ppmV/4h
Carbon dioxide (124-38-9)	
LC50 inhalation rat (ppm)	820000 ppm/4h
Nitrous oxide (10024-97-2)	
LC50 inhalation rat (ppm)	250000 ppm/4h
Oxygen (7782-44-7)	
LC50 inhalation rat (ppm)	800000 ppm/4h

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified

Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: May cause drowsiness or dizziness.

Specific target organ toxicity (repeated exposure)	: Not classified
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Aspiration hazard	: Not classified
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Symptoms/injuries after inhalation	: May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness. May increase respiration and heart rate.
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Symptoms/injuries after skin contact	: Adverse effects not expected from this product.
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## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Symptoms/injuries after eye contact	: Adverse effects not expected from this product.
Symptoms/injuries after ingestion	: Ingestion is not considered a potential route of exposure.
Symptoms/injuries upon intravenous administration	: Not known.
Chronic symptoms	: Adverse effects not expected from this product.

## SECTION 12: Ecological information

### 12.1. Toxicity

No additional information available

### 12.2. Persistence and degradability

<b>Trifluoromethane (R23) (75-46-7)</b>	
Persistence and degradability	No data available.
<b>Carbon dioxide (124-38-9)</b>	
Persistence and degradability	No ecological damage caused by this product.
<b>Nitrous oxide (10024-97-2)</b>	
Persistence and degradability	Not applicable for inorganic gases.
<b>Oxygen (7782-44-7)</b>	
Persistence and degradability	No ecological damage caused by this product.

### 12.3. Bioaccumulative potential

<b>Trifluoromethane (R23) (75-46-7)</b>	
Log Pow	0.64
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.
<b>Carbon dioxide (124-38-9)</b>	
BCF fish 1	(no bioaccumulation)
Log Pow	0.83
Bioaccumulative potential	No ecological damage caused by this product.
<b>Nitrous oxide (10024-97-2)</b>	
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No data available.
<b>Oxygen (7782-44-7)</b>	
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No ecological damage caused by this product.

### 12.4. Mobility in soil

<b>Trifluoromethane (R23) (75-46-7)</b>	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
<b>Carbon dioxide (124-38-9)</b>	
Ecology - soil	No ecological damage caused by this product.
<b>Nitrous oxide (10024-97-2)</b>	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
<b>Oxygen (7782-44-7)</b>	
Ecology - soil	No ecological damage caused by this product.

### 12.5. Other adverse effects

Effect on ozone layer	: No known effects from this product.
Effect on the global warming	: 1690.78

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## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 13: Disposal considerations



#### 13.1. Waste treatment methods

- Waste treatment methods : Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.
- Waste disposal recommendations : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at [www.cganet.com](http://www.cganet.com) for more guidance on suitable disposal methods.

### SECTION 14: Transport information

#### Department of Transportation (DOT)

In accordance with DOT

- Transport document description : UN3156 Compressed gas, oxidizing, n.o.s. (Nitrous Oxide, Oxygen)
- UN-No.(DOT) : UN3156
- Proper Shipping Name (DOT) : Compressed gas, oxidizing, n.o.s.
- Hazard labels (DOT) : 2.2 - Non-flammable gas  
5.1 - Oxidizer
-  
- DOT Packaging Non Bulk (49 CFR 173.xxx) : 302
- DOT Packaging Bulk (49 CFR 173.xxx) : 314;315
- DOT Symbols : G - Identifies PSN requiring a technical name
- DOT Special Provisions (49 CFR 172.102) : A14 - This material is not authorized to be transported as a limited quantity or consumer commodity in accordance with 173.306 of this subchapter when transported aboard an aircraft.
- DOT Packaging Exceptions (49 CFR 173.xxx) : 306
- DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 75 kg
- DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg
- DOT Vessel Stowage Location : D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.

#### Additional information

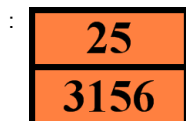
- Other information : No supplementary information available.

#### ADR

- Transport document description : UN 3156, 2.2 (5.1), (E)
- Class (ADR) : 2 - Gases
- Hazard identification number (Kemler No.) : 25
- Classification code (ADR) : 10
- Hazard labels (ADR) : 2.2 - Non-flammable compressed gas  
5.1 - Oxidizer



Orange plates



- Tunnel restriction code (ADR) : E

# Halocarbon-23 (0.0001% - 20.0000%), Carbon Dioxide (3.0000% - 60.4999%), Nitrous Oxide (20.0000% - 77.4999%) in Oxygen

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Limited quantities (ADR) : 0  
Excepted quantities (ADR) : E0

### Transport by sea

UN-No. (IMDG) : 3156  
Proper Shipping Name (IMDG) : COMPRESSED GAS, OXIDIZING, N.O.S.  
Class (IMDG) : 2 - Gases

### Air transport

UN-No.(IATA) : 3156  
Proper Shipping Name (IATA) : COMPRESSED GAS, OXIDIZING, N.O.S.  
Class (IATA) : 2

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Trifluoromethane (R23) (75-46-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### Carbon dioxide (124-38-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### Nitrous oxide (10024-97-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### Oxygen (7782-44-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

##### Trifluoromethane (R23) (75-46-7)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class A - Compressed Gas
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##### Carbon dioxide (124-38-9)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class A - Compressed Gas
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##### Nitrous oxide (10024-97-2)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class A - Compressed Gas Class C - Oxidizing Material Class D Division 2 Subdivision A - Very toxic material causing other toxic effects
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##### Oxygen (7782-44-7)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class A - Compressed Gas Class C - Oxidizing Material
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#### EU-Regulations

##### Trifluoromethane (R23) (75-46-7)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

##### Carbon dioxide (124-38-9)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

##### Nitrous oxide (10024-97-2)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

##### Oxygen (7782-44-7)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not classified



# Halocarbon-23 (0.0001% - 20.0000%), Carbon Dioxide (3.0000% - 60.4999%), Nitrous Oxide (20.0000% - 77.4999%) in Oxygen

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

No additional information available

### National regulations

#### Trifluoromethane (R23) (75-46-7)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

#### Carbon dioxide (124-38-9)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on the Canadian IDL (Ingredient Disclosure List)

#### Nitrous oxide (10024-97-2)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on the Canadian IDL (Ingredient Disclosure List)

#### Oxygen (7782-44-7)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

### 15.3. US State regulations

#### Nitrous oxide (10024-97-2)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significance risk level (NSRL)
No	Yes	Yes	No	

#### Trifluoromethane (R23) (75-46-7)

U.S. - New Jersey - Right to Know Hazardous Substance List

#### Carbon dioxide (124-38-9)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List

#### Nitrous oxide (10024-97-2)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List

#### Oxygen (7782-44-7)

U.S. - Massachusetts - Right To Know List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List

# Halocarbon-23 (0.0001% - 20.0000%), Carbon Dioxide (3.0000% - 60.4999%), Nitrous Oxide (20.0000% - 77.4999%) in Oxygen

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 16: Other information

- Indication of changes : Revised safety data sheet in accordance with OSHA final rule on GHS implementation promulgated March 26, 2012.
- Other information : This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

Full text of H-phrases:

Compressed gas	Gases under pressure Compressed gas
Liquefied gas	Gases under pressure Liquefied gas
Ox. Gas 1	Oxidizing gases Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H270	May cause or intensify fire; oxidizer
H280	Contains gas under pressure; may explode if heated
H336	May cause drowsiness or dizziness

SDS US (GHS HazCom 2012)

*This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation'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 product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.*