

# Material Safety Data Sheet



Anesthetic Calibration Mixture: Carbon Dioxide / Nitrogen / Nitrous Oxide / Oxygen / Sevoflurane

## Section 1. Chemical product and company identification

**Product Name** : Anesthetic Calibration Mixture: Carbon Dioxide / Nitrogen / Nitrous Oxide / Oxygen / Sevoflurane

**Supplier** : AIRGAS INC., on behalf of its subsidiaries  
259 North Radnor-Chester Road  
Suite 100  
Radnor, PA 19087-5283  
1-610-687-5253

**Product use** : Synthetic/Analytical chemistry.

**MSDS#** : 005211

**Date of Preparation/Revision** : **3/30/2006.**

**In case of emergency** : 1-866-734-3438

## Section 2. Hazards identification

**Physical state** : Gas.

**Emergency overview** : Warning!  
OXIDIZER.  
CONTENTS UNDER PRESSURE.  
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, REPRODUCTIVE SYSTEM, CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.  
MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.  
POSSIBLE CANCER HAZARD  
CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.  
Contact with combustible material may cause fire.  
|Can cause anesthetic effects  
Avoid contact with skin and clothing. Avoid breathing gas. Do not puncture or incinerate container. Store in tightly closed container. Avoid contact with combustible materials. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.  
Contact with rapidly expanding gases can cause frostbite.

**Routes of entry** : Inhalation,Dermal,Eyes

**Potential acute health effects**

**Eyes** : Moderately irritating to the eyes.

**Skin** : Moderately irritating to the skin.

**Inhalation** : Moderately irritating to the respiratory system.

**Ingestion** : Ingestion is not a normal route of exposure for gases

**Potential chronic health effects** : **CARCINOGENIC EFFECTS** Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [nitrous oxide].  
**MUTAGENIC EFFECTS** Not available.  
**TERATOGENIC EFFECTS**: Not available.

**Medical conditions aggravated by overexposure** : Acute or chronic respiratory conditions may be aggravated by overexposure to this gas.

**See toxicological Information (section 11)**

## Section 3. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
Nitrous Oxide	10024-97-2	0.005 - 90	<p><b>ACGIH TLV (United States, 1/2004). Notes: 1996 Adoption Refers to Appendix A -- Carcinogens.</b>                      TWA: 90 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      TWA: 50 ppm 8 hour(s). Form: All forms</p> <p><b>NIOSH REL (United States, 12/2001). Notes: TWA over the time exposed Note: REL for exposure to waste anesthetic gas.</b>                      TWA: 46 mg/m<sup>3</sup> 10 hour(s). Form: All forms                      TWA: 25 ppm 10 hour(s). Form: All forms</p>
Oxygen	7782-44-7	1 - 90	<p><b>ACGIH TLV (United States, 9/2004).</b>                      STEL: 54000 mg/m<sup>3</sup> 15 minute(s). Form: All forms                      STEL: 30000 ppm 15 minute(s). Form: All forms                      TWA: 9000 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      TWA: 5000 ppm 8 hour(s). Form: All forms</p> <p><b>NIOSH REL (United States, 6/2001).</b>                      STEL: 54000 mg/m<sup>3</sup> 15 minute(s). Form: All forms                      STEL: 30000 ppm 15 minute(s). Form: All forms                      TWA: 9000 mg/m<sup>3</sup> 10 hour(s). Form: All forms                      TWA: 5000 ppm 10 hour(s). Form: All forms</p> <p><b>OSHA PEL (United States, 6/1993).</b>                      TWA: 9000 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      TWA: 5000 ppm 8 hour(s). Form: All forms</p> <p><b>Työterveyslaitos (Finland, 4/2005).</b>                      STEL: 170 mg/m<sup>3</sup> 15 minute(s). Form: All forms                      STEL: 20 ppm 15 minute(s). Form: All forms                      TWA: 83 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      TWA: 10 ppm 8 hour(s). Form: All forms</p> <p><b>Arbeidstilsynet (Norway, 10/2003).</b>                      AN: 140 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      AN: 20 ppm 8 hour(s). Form: All forms</p> <p><b>AFS (Sweden, 6/2005).</b>                      KTV: 170 mg/m<sup>3</sup> 15 minute(s). Form: All forms                      KTV: 20 ppm 15 minute(s). Form: All forms                      NGV: 80 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      NGV: 10 ppm 8 hour(s). Form: All forms</p>
Nitrogen	7727-37-9	1 - 75	
Carbon Dioxide	124-38-9	0.5 - 20	
Sevoflurane	28523-86-6	1 - 10	

## Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

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- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

## Section 5. Fire fighting measures

- Flammability of the product** : Non-flammable.
- Products of combustion** : These products are carbon oxides (CO, CO<sub>2</sub>), nitrogen oxides (NO, NO<sub>2</sub>...), halogenated compounds, hydrogen fluoride.
- Fire fighting media and instructions** : Use an extinguishing agent suitable for surrounding fires.
- If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.
- This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire.
- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

## Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Do not touch or walk through spilled material.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 7. Handling and storage

- Handling** : Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Store in tightly closed container. Avoid contact with combustible materials. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

## Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Personal protection**
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

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**Personal protection in case of a large spill** : A self-contained breathing apparatus should be used to avoid inhalation of the product.

Consult local authorities for acceptable exposure limits.

## Section 9. Physical and chemical properties

<b>Molecular weight</b>	: Not applicable.
<b>Molecular formula</b>	: Not applicable.
<b>Boiling/condensation point</b>	: Not available.
<b>Melting/freezing point</b>	: -90.99°C (-131.8°F) based on data for: nitrous oxide. Weighted average: -171.01°C (-275.8°F)
<b>Critical temperature</b>	: The lowest known value is -146.9°C (-232.4°F) (Nitrogen).
<b>Vapor density</b>	: The highest known value is 1.53 (Air = 1) (nitrous oxide). Weighted average: 1.24 (Air = 1)
<b>Specific Volume (ft³/lb)</b>	: Not applicable.
<b>Gas Density (lb/ft³)</b>	: Weighted average: 0.09

## Section 10. Stability and reactivity

<b>Stability and reactivity</b>	: The product is stable.
<b>Conditions of instability</b>	: Under normal conditions of storage and use, hazardous polymerization will not occur. (propane, 1,1,1,3,3,3-hexafluoro-2-(fluoromethoxy)-)
<b>Incompatibility with various substances</b>	: Reactive with, combustible materials.
<b>Hazardous decomposition products</b>	: These products are halogenated compounds, hydrogen fluoride.

## Section 11. Toxicological information

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Sevoflurane	LD50	37200 mg/kg	Oral	Rat
	LC50	58000 ppm (1 hour(s))	Inhalation	Rat

**Chronic effects on humans** : **CARCINOGENIC EFFECTS** Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [nitrous oxide]. Contains material which causes damage to the following organs: lungs, the reproductive system, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

**Other toxic effects on humans** : Not considered to be toxic for humans.

### Specific effects

<b>Carcinogenic effects</b>	: Contains material which may cause cancer based on animal data. Risk of cancer depends on duration and level of exposure.
<b>Mutagenic effects</b>	: No known significant effects or critical hazards.
<b>Reproduction toxicity</b>	: No known significant effects or critical hazards.







## Section 12. Ecological information

<b>Products of degradation</b>	: These products are carbon oxides (CO, CO <sub>2</sub> ) and water, nitrogen oxides (NO, NO <sub>2</sub> ...), halogenated compounds.
<b>Toxicity of the products of biodegradation</b>	: The products of degradation are more toxic than the product itself.
<b>Environmental fate</b>	: Not available.
<b>Environmental hazards</b>	: No known significant effects or critical hazards.
<b>Toxicity to the environment</b>	: Not available.

## Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

## Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
<b>DOT Classification</b>	UN3156	COMPRESSED GAS, OXIDIZING, N.O.S.	2.2	Not applicable (gas).	 	-
<b>TDG Classification</b>	UN3156	COMPRESSED GAS, OXIDIZING, N.O.S.	2.2	Not applicable (gas).	 	<p><b>Explosive Limit and Limited Quantity Index</b> 0</p> <p><b>ERAP Index</b> 3000</p> <p><b>Passenger Carrying Ship Index</b> Forbidden</p> <p><b>Passenger Carrying Road or Rail Index</b> 75</p>
<b>Mexico Classification</b>	UN3156	COMPRESSED GAS, OXIDIZING, N.O.S.	2.2	Not applicable (gas).	 	-

## Section 15. Regulatory information

### United States

**U.S. Federal regulations** : TSCA 8(b) inventory: Nitrogen; nitrous oxide; Oxygen; Carbon Dioxide  
 SARA 302/304/311/312 extremely hazardous substances: No products were found.  
 SARA 302/304 emergency planning and notification: No products were found.  
 SARA 302/304/311/312 hazardous chemicals: Nitrogen; nitrous oxide; Oxygen; Carbon Dioxide  
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Nitrogen: Sudden Release of Pressure; nitrous oxide: Fire hazard, Sudden Release of Pressure, Delayed (Chronic) Health Hazard; Oxygen: Fire hazard, Sudden Release of Pressure, Delayed (Chronic) Health Hazard; Carbon Dioxide: Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard  
 Clean Water Act (CWA) 307: No products were found.

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Clean Water Act (CWA) 311: No products were found.  
 Clean air act (CAA) 112 accidental release prevention: No products were found.  
 Clean air act (CAA) 112 regulated flammable substances: No products were found.  
 Clean air act (CAA) 112 regulated toxic substances: No products were found.

**State regulations**

- : Pennsylvania RTK: Nitrogen: (generic environmental hazard); nitrous oxide: (generic environmental hazard); Oxygen: (generic environmental hazard); Carbon Dioxide: (generic environmental hazard)
- Massachusetts RTK: Nitrogen; nitrous oxide; Oxygen; Carbon Dioxide
- New Jersey: Nitrogen; nitrous oxide; Oxygen; Carbon Dioxide

**Canada**

**WHMIS (Canada)**

- : Class A: Compressed gas.
- Class D-2A: Material causing other toxic effects (VERY TOXIC).
- CEPA DSL: Nitrogen; nitrous oxide; Oxygen; Carbon Dioxide

**Section 16. Other information**

**United States**

**Label Requirements**

- : OXIDIZER.
- CONTENTS UNDER PRESSURE.
- CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, REPRODUCTIVE SYSTEM, CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
- MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
- POSSIBLE CANCER HAZARD
- CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.
- CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.

**Canada**

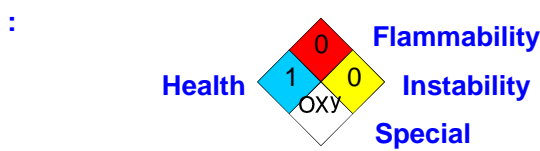
**Label Requirements**

- : Class A: Compressed gas.
- Class D-2A: Material causing other toxic effects (VERY TOXIC).

**Hazardous Material Information System (U.S.A.)**

Health	*	1
Fire hazard		0
Reactivity		0
Personal protection		C

**National Fire Protection Association (U.S.A.)**



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