PRODUCT NAME: Bevgas #s 4 & 10

Material Safety Data Sheet

Identification

Product Name: Bevgas #4 & #10
CAS Number: N/A

Chemical Family: Gas Mixture, Carbon Dioxide in Oxygen
Chemical Formula: CO₂ 20.0% to 60% in O₂
Common Names/Synonyms: Food Packaging and Carbon Dioxide in Oxygen mixtures
TDG (Canada) Classification: 2.2
WHMIS Classification: A
MSDS Identification Code/Number: BG-4
Prepared By: Quality

Revision Date: 02/24/05
Last Review Date: 02/24/05

Composition/Information on Ingredients

Exposure Limits:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>% VOLUME</th>
<th>PEL-OSHA</th>
<th>TIV-ACGIH</th>
<th>LD₅₀ OR LC₅₀ Route/Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Dioxide</td>
<td>20.0% to 60%</td>
<td>5000 ppm TWA</td>
<td>5000 ppm TWA</td>
<td>Not Available</td>
</tr>
<tr>
<td>FORMULA: CO₂</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS #: 124-38-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTECS #: FF6400000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>40% to 80%</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>FORMULA: O₂</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS #: 7782-44-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTECS #: RS2060000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.
2 As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)
3 As stated in the ACGIH 2004 Threshold Limit Values for Chemical Substances and Physical Agents

IDLH (Carbon Dioxide): 40,000 ppm
OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

Hazards Identification

Emergency Overview:
Odorless, colorless, nonflammable gas. Oxidizer. Will accelerate combustion and increase the risk of fire and explosion in combustible or flammable material. Carbon dioxide exposure can cause nausea and respiratory problems. High concentrations of carbon dioxide may cause vasodilatation leading to circulatory collapse. Prolonged inhalation of high concentrations of oxygen may cause coughing and lung effects. Elevated oxygen levels may result in cough and other pulmonary changes. Contents under pressure. Use and store below 125°F (52°C).

Route of Entry:

<table>
<thead>
<tr>
<th>Skin Contact</th>
<th>Skin Absorption</th>
<th>Eye Contact</th>
<th>Inhalation</th>
<th>Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Prepared By: Quality
Health Effects:

<table>
<thead>
<tr>
<th>Exposure Limits</th>
<th>Irritant</th>
<th>Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Teratogen</td>
<td>Reproductive Hazard</td>
<td>Mutagen</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Synergistic Effects
None known

Carcinogenicity:  NTP: No  IARC: No  OSHA: No

Eye Effects:
None known or expected.

Skin Effects:
None known or expected.

Ingestion Effects:
Ingestion is unlikely; product is a gas at room temperature.

Inhalation Effects:
Carbon dioxide is a cerebral vasodilator. Inhaling large concentrations can cause rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low concentrations of carbon dioxide. Low concentrations of carbon dioxide cause increased respiration and headache.

Oxygen is non-toxic. Prolonged inhalation of high oxygen concentrations (>75%) may effect coordination, attention, and cause tiredness or respiratory irritation.

Oxygen is more toxic when inhaled at elevated pressures. Depending upon pressure and duration of exposure, pure oxygen at elevated pressures (i.e.: divers) may cause cramps, dizziness, difficulty breathing, convulsions, edema and death.

Elevated oxygen concentrations in incubators have caused visual impairment and blindness in premature infants. High oxygen concentrations primarily affect eyes which are not fully developed.

Medical Conditions Aggravated by Exposure:
None known.

NFPA Hazard Codes  HMIS Hazard Codes  Ratings System
Health: 0  Health: 0  0 = No Hazard
Flammability: 0  Flammability: 0  1 = Slight Hazard
Reactivity: 0  Physical Hazard: 3  2 = Moderate Hazard
OXIDIZER  3 = Serious Hazard
4 = Severe Hazard

First Aid Measures

Eyes:
None normally required.

Skin:
None normally required.

Ingestion:
Not normally required.
First Aid Measures Continued

Inhalation:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO PRODUCT. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted (artificial) respiration and supplemental oxygen. Further treatment should be symptomatic and supportive. Inform the treating physician that the patient could be experiencing overexposure to carbon dioxide or hypoxia.

Fire Fighting Measures

<table>
<thead>
<tr>
<th>Conditions of Flammability:</th>
<th>Not flammable, Oxidizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point:</td>
<td>None</td>
</tr>
<tr>
<td>Method:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Auto ignition Temperature:</td>
<td>None</td>
</tr>
</tbody>
</table>

| Hazardous combustion products: | None |
| Sensitivity to mechanical shock: | None |
| Sensitivity to static discharge: | None |

Fire and Explosion Hazards:
Can readily support or initiate combustion/explosion of organic matter and other oxidizable material. Cylinder may vent rapidly or rupture violently from pressure when involved in a fire situation.

Extinguishing Media:
Use extinguishing agent appropriate for the combustible materials involved in the fire. Use water spray to keep cylinders cool.

Fire Fighting Instructions:
Firefighters should wear a NIOSH/MSHA approved full-facepiece self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout or Bunker gear. If possible, stop the flow of gas which is accelerating the fire. Continue to cool fire-exposed cylinders until well after flames are extinguished.

Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. A leak near combustible or flammable materials may represent a severe fire or explosion hazard. Eliminate all ignition sources. Stop or control leak if it can be done without risk. Use water spray as necessary to disperse vapors and protect personnel. If leak is in user’s equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest Norco location.

Handling and Storage

Electrical Classification:
Non-hazardous

Dry product is noncorrosive and may be used with any common structural material. Moisture causes metal oxides which are formed with air to be hydrated so that they include volume and lose their protective role (rust formation). Concentrations of SO₂, Cl₂, salt etc. in the moisture enhances the rusting of metals in air. Carbon dioxide may react with moisture to form carbonic acid.

Oxygen should not be used as a substitute for compressed air in pneumatic equipment since it generally contains flammable lubricants. Equipment to contain oxygen must be “cleaned for oxygen service”. Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous backflow into the cylinder.
Handling and Storage Continued

Protect cylinders from physical damage. Store in a cool, dry, well-ventilated area away from heavy traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a “first in, first out” inventory system to prevent full cylinders being stored for excessive periods of time. Post “NO SMOKING OR OPEN FLAMES” signs in the storage area or use area. There should be no sources of ignition in the storage or use area. Outside or detached storage preferred.

For additional recommendations, consult Compressed Gas Association’s Pamphlets P-1.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

Exposure Controls, Personal Protection

Engineering Controls:
Use local exhaust ventilation as necessary to maintain atmospheric oxygen levels above 19.5% and below 23.5% and control air contaminants to below acceptable exposure guidelines.

Eye/Face Protection:
Safety goggles or glasses as appropriate for the job.

Skin Protection:
Protective gloves made of suitable material appropriate for the job.

Respiratory Protection:
A supplied air respirator with full face piece equipped with an escape bottle or a self-contained breathing apparatus should be available for emergency use. Operate this equipment in the positive pressure demand mode.

Other/General Protection:
Safety shoes.

Physical and Chemical Properties

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state (gas, liquid, solid)</td>
<td>: Gas</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>Vapor density (Air = 1)</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>Evaporation point</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>Boiling point</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>Freezing point</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>Specific gravity at STP (Air = 1)</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>Oil/water partition coefficient</td>
<td>: Not Available</td>
<td></td>
</tr>
<tr>
<td>Solubility (H₂O)</td>
<td>: Slightly soluble</td>
<td></td>
</tr>
<tr>
<td>Odor threshold</td>
<td>: Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Odor and appearance</td>
<td>: Odorless, colorless gas</td>
<td></td>
</tr>
</tbody>
</table>

Stability and Reactivity

Stability:
Stable

Incompatible Materials:
Organic, combustible and flammable materials.
Stability and Reactivity Continued

Hazardous Decomposition Products:
None known.

Hazardous Polymerization:
Will not occur.

Toxicological Information

Inhalation:
Carbon dioxide may cause cerebral vasodilatation. Inhaling large concentrations causes rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low (3 to 5 molar %) concentrations.

Human volunteers which inhaled 90-95% oxygen through a face mask for 6 hours showed signs of tracheal irritation and fatigue. Other symptoms (which might have been caused by placing a tube into the trachea during the experiment) included: sinusitis, conjunctivitis, fever and symptoms of acute bronchitis.

Poisoning began in dogs 36 hours after inhalation of pure oxygen at atmospheric pressure. Distress was seen within 48 hours and death within 60 hours.

Skin and Eye:
The incompletely developed retinal circulation is more susceptible to toxic levels of oxygen. In premature infants, arterial oxygen tension above 150 mm Hg may cause retrolental fibroplasia. Permanent blindness may occur several months later. One case of severe retinal damage in an adult was reported. An individual suffering from myasthenia gravis developed irreversible retinal atrophy after breathing 80% oxygen for 150 days.

Reproductive:
Exposure of female rats to 60,000 ppm carbon dioxide for 24 hours has produced toxic effects to the embryo and fetus in pregnant rats. Toxic effects to the reproductive system have been observed in other mammalian species at similar concentrations.

Ecological Information

No data given.

Disposal Considerations

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled with any valve outlet plugs or caps secure and valve protection cap in place to Norco for proper disposal.

Transport Information

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>United States DOT</th>
<th>Canada TDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name:</td>
<td>Carbon Dioxide and Oxygen Mixtures,</td>
<td>Carbon Dioxide and Oxygen Mixtures,</td>
</tr>
<tr>
<td></td>
<td>Compressed</td>
<td>Compressed</td>
</tr>
<tr>
<td>Hazard Class:</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Identification Number</td>
<td>UN 1014</td>
<td>UN 1014</td>
</tr>
<tr>
<td>Shipping label:</td>
<td>Non-flammable gas, Oxidizer</td>
<td>Non-flammable gas, Oxidizer</td>
</tr>
</tbody>
</table>
**Regulatory Information**

**SARA Title III Notifications and Information**

SARA 313: This product does not contain ingredients subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

**SARA Title III – Hazard Classes:**
Fire Hazard
Sudden Release of Pressure Hazard

**Other Information**

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

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