Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Liqui-Med Analgesic Gas Mixture	**Trade Name:**	Liqui-Med Analgesic Gas Mixture
Product Use:	Analgesic.		
Chemical Name:	Liqui-Med Analgesic Gas Mixture	**Synonym:**	Not applicable.
Chemical Formula:	Not applicable.	**Chemical Family:**	Not applicable.
Telephone:	**Emergencies:** * 1-800-363-0042	**Supplier /Manufacture:**	Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2
		Phone:	905-803-1600
		Fax:	905-803-1682

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD_{50} (Species & Routes)	LC_{50} (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Nitrous oxide	50	10024-97-2	Not available.	Not available.	50 ppm
Oxygen	50	7782-44-7	Not available.	Not available.	Not available.

3. Hazards Identification

Emergency Overview

WARNING! High-pressure, oxidizing gas. Vigorously accelerates combustion. Harmful if inhaled. Can cause rapid suffociation. May cause nervous system damage. May cause red blood cell damage. May cause frostbite. May cause dizziness and drowsiness. May cause embryo fetal toxicity.

ROUTES OF EXPOSURE: Inhalation.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: May cause excitation, euphoria, dizziness, drowsiness, incoordination, and narcosis. Analgesia (reduced sensitivity to pain) begins to occur at 10% nitrous oxide and exposure to concentrations of Nitrous Oxide of 50% and greater will produce clinical anesthesia. Anesthesia is accompanied by depressed pulse rate and high concentrations may cause asphyxia and death. This mixture contains 50% oxygen to support life and avoid the asphyxiation hazard of pure Nitrous oxide.

SKIN CONTACT:	No evidence of adverse effects from available information.
SKIN ABSORPTION:	No evidence of adverse effects from available information.
SWALLOWING:	An unlikely route of exposure. This product is a gas at normal temperature and pressure.
EYE CONTACT:	No evidence of adverse effects from available information.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:
Metabolic injury to the nervous system has resulted from frequent exposure to anaesthetic concentrations of Nitrous Oxide. Complaints include numbness, tingling of hands and legs, loss of feeling in fingers, poor balance, and muscular weakness.

OTHER EFFECTS OF OVEREXPOSURE:
Exposure to Nitrous Oxide has produced embryo fetal toxicity in laboratory animals as evidenced by reduced fetal weight, delayed ossification, and increased incidence of visceral and skeletal variations. Exposure to Nitrous Oxide may be associated with an increased incidence of abortion in humans. Single prolonged exposure to high concentrations of Nitrous Oxide has resulted in bone marrow injury and adverse effects on the blood.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
Haemostatic gases in general, and Nitrous Oxide in particular, may suppress immunological function when administered for anaesthetic purpose. This may reduce the resistance to infection and other immuno-dependent disease process.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:
None.

CARCINOGENICITY:
Classified A4 (Not classifiable for human or animal.) by ACGIH [Nitrous oxide].

4. First Aid Measures

INHALATION:
Remove to fresh air. If not breathing, give artifical respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT:
No emergency care anticipated.

SWALLOWING:
This product is a gas at normal temperature and pressure.

EYE CONTACT:
No emergency care anticipated.

NOTES TO PHYSICIAN:
Treatment of overexposure should be directed at the control of symptoms and the clinical condition. Nitrous Oxide may cause vitamin B12 deficiency. Megaloblastic anemia and nervous system disorders can occur as a result of this chemically induced deficiency.

5. Fire Fighting Measures

FLAMMABLE :	No.	**IF YES, UNDER WHAT CONDITIONS?**	Not applicable.
FLASH POINT (test method)	Not applicable.	**AUTOIGNITION TEMPERATURE**	Not applicable.
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** Not applicable.	**UPPER:**	Not applicable.

EXTINGUISHING MEDIA:

This mixture cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

WARNING Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. If containers are leaking, reduce vapours with water spray or fog. Shut off leak if without risk. Move containers away form fire area if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Oxidizing agent; vigorously accelerates combustion. Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 52 C. Cylinders containing this mixture are equipped with a pressure relief device. (Exceptions may exist where authorized by TDG regulations.)

HAZARDOUS COMBUSTION PRODUCTS:

See “Hazardous Decomposition Products” section.

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Possible, see "Unusual Fire and Explosion Hazards" section.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

WARNING! **High-pressure, oxidizing gas.** May be harmful if inhaled. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD:

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING:

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier.

For additional information on stroage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

HIGH-PRESSURE, OXIDIZING GAS Use piping and equipment adequately designed to withstand pressures to be encountered. **Vigorously accelerates combustion.** Keep oil, grease, and combustibles away. **Store and use with adequate ventilation.** Close valve after each use; keep closed even when empty. **Never work on a pressurized system.** If there is a leak, close the cylinder valve. Blow the system down in an environmentally safe manner in compliance with all federal, provincial, and local laws, then repair the leak. **Never allow a compressed gas cylinder to become part of an electrical circuit.** Electric arcs weaken cylinder metal and can cause catastrophic failure.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST: Acceptable. See SPECIAL.

MECHANICAL (general): Inadequate. See SPECIAL.

SPECIAL: Use only in a closed system.

OTHER: See SPECIAL.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION: Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with the provincial regulations or guidelines. Selection should also be based on the current CSA standards Z94.4, "Selection, care and use of respirators". Respirators should be approved by NIOSH and MSHA.

SKIN PROTECTION: Preferred for cylinder handling.

EYE PROTECTION: Wear safety glasses when handling cylinders.

Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

9. Physical and Chemical Properties

PHYSICAL STATE:	Gas.	**FREEZING POINT:**	Not available.	**pH:**	Not available.
BOILING POINT	Not available.	**VAPOUR PRESSURE**	Gas	**MOLECULAR WEIGHT:**	Not applicable.
SPECIFIC GRAVITY: LIQUID (Water = 1)	Not available.	**SOLUBILITY IN WATER,**	Not available.		
SPECIFIC GRAVITY: VAPOUR (air = 1)	1.25	**EVAPORATION RATE** (Butyl Acetate=1):	Not available.	**COEFFICIENT OF WATER/OIL DISTRIBUTION:**	Not applicable.
VAPOUR DENSITY:	Not available.	**% VOLATILES BY VOLUME:**	100%	**ODOUR THRESHOLD:**	Not available.
APPEARANCE & ODOUR:	Sweet odour				

Colourless gas at normal temperature and pressure.

10. Stability and Reactivity

STABILITY:	The product is stable.
CONDITIONS OF CHEMICAL INSTABILITY:	Avoid high temperatures at cylinder pressure. See Section VII-Preventive Measures.
INCOMPATIBILITY (materials to avoid):	Oils, greases, flammable materials, alkali metals, aluminum, boron, tungsten carbide.
HAZARDOUS DECOMPOSITION PRODUCTS:	Nitrous oxide decomposes explosively at high temperature forming a mixture of Nitrogen and Oxygen. This reaction will occur at lower temperatures in the presence of catalytic surfaces such as silver, platinum, cobalt, copper oxides or nickel oxides.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS OF REACTIVITY:	None.

11. Toxicological Information

See section 3.

12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

TDG/IMO SHIPPING NAME: Compressed gas, oxidizing, n.o.s.(oxygen)

HAZARD CLASS: CLASS 2.2(5.1): Non-flammable, non-corrosive, non-toxic gas and oxidizing material	**IDENTIFICATION #:** UN3156	**PRODUCT RQ:** Any accidental release in a quantity that could pose a danger to public safety or any sustained release of 10 minutes or more

SHIPPING LABEL(s): Special Oxidizer with Class 2 at bottom.

PLACARD (when required): Special Oxidizer with Class 2 at bottom.

SPECIAL SHIPPING INFORMATION:

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, non-ventilated compartment of a vehicle can present serious safety hazards.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations.

WHMIS (Canada) CLASS A: Compressed gas.
CLASS C: Oxidizing material.
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

International Regulations

EINECS Not available.

DSCL (EEC) R8- Contact with combustible material may cause fire.

International Lists No products were found.

16. Other Information

MIXTURES:

When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

HAZARD RATING SYSTEM:

HMIS RATINGS:

HEALTH	1*
FLAMMABILITY	0
PHYSICAL HAZARD	2

*An Asterisk used in conjuction whith HMIS health hazards ratings designates a carcinogenic or reproductive hazard.

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED: CGA-280

PIN-INDEXED YOKE: Not applicable.

ULTRA-HIGH-INTEGRITY CONNECTION: Not applicable.

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

AV-1	Safe Handling and Storage of Compressed Gas
P-1	Safe Handling of Compressed Gases in Containers
V-1	Compressed Gas Cylinder Valve Inlet and Outlet Connections
V-7	Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures
--	Handbook of Compressed Gases, Fifth Edition

Only medical grade gases may be administered and then only under the supervision of qualified personnel for both their own and the patient's protection. Non-supervised inhalation of medical or non-medical gases in this class can be very dangerous if there is no one to help control the effects. Refer to special handling procedure.

For more indepth information for each component, refer to the pure product MSDS.

The information contained in this MSDS is generated from technical sources using the Chemmate Mixture MSDS system and the pure-product MSDS for each component. These mixtures are not tested as a whole for chemical, physical, or health effects.

PREPARATION INFORMATION:

DATE: **October 15, 2013**
DEPARTMENT: **Safety and Environmental Services**
TELEPHONE: **905-803-1600**

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety nformation, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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