MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE
Containing the Following Component in a Nitrogen Balance Gas:
Phosphine: 0.00001- 0.002%
SYNONYMS: Not Applicable
CHEMICAL FAMILY NAME: Not Applicable
FORMULA: Not Applicable
Document Number: MSDS1095 (99-0271)
Note: This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.
PRODUCT USE: Calibration of Monitoring and Research Equipment

SUPPLIER/MANUFACTURER'S NAME: Portagas
ADDRESS: 1202 E. Sam Houston Pkwy S.
Pasadena, TX 77503
BUSINESS PHONE: (713) 928-6477 General MSDS Info
EMERGENCY PHONE: INFOTRAC: (800) 535-5053

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL		NIOSH	OTHER
			TWA ppm	STEL ppm	TWA ppm	STEL ppm	IDLH ppm	ppm
Phosphine	7803-51-2	0.00001-0.002%	0.3	1	0.3	1 (Vacated 1989 PEL)	50 ppm	NIOSH RELs: TWA = 0.3 STEL = 1 DFG MAKs: TWA = 0.1 PEAK = 1•MAK 15 min., average value, I hr interval Carcinogen: EPA-D
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established. See Section 16 for Definitions of Terms Used.
NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This gas mixture has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This gas mixture is a colorless gas which is odorless. The Phosphine component of this gas mixture is an extremely toxic gas; even brief over-exposures to relatively low doses may have significant health consequences. Effects of an acute over-exposure include central nervous system disorders (i.e. headaches, tremors), lung problems, abdominal pains, effects on the heart. Additionally, releases of this gas mixture may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this gas mixture is by inhalation.
INHALATION: Due to the small size of an individual cylinder of this gas mixture, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. The health hazard associated with this gas mixture are the potential for over-exposure to The Phosphine component of this gas mixture and oxygen displacement if this gas mixture is released in small, poorly-ventilated areas (i.e. enclosed or confined spaces).
Phosphine is an extremely toxic gas. It is anticipated that, due to the low concentration (0.1-20 ppm) of Phosphine and the fact this gas mixture is quickly dissipated, employees will not be exposed to levels above those listed in Section 2 (Composition and Information on Ingredients). However, because Phosphine can produce significant health effects at relatively low levels, individuals using this gas mixture must be aware of the symptoms of over-exposure.
Non-lethal exposures may result in the following symptoms: lacrimation (watery eyes), substernal chest pain, chest tightness, shortness of breath, a slight cough, and cyanosis. Such exposures can cause gastrointestinal tract irritation and central nervous system effects. Abdominal symptoms include nausea, vomiting, severe epigastric pain, and diarrhea. Neurologic symptoms include vertigo, headache, restlessness, involuntary tremors, lack of muscular coordination, double vision, drowsiness, and a decreased sensation in the extremities.

Additionally, under some circumstances, 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. The effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN	OBSERVED EFFECT
12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

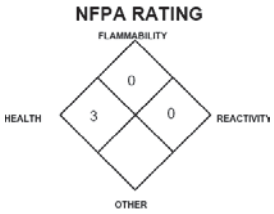
CONTACT WITH THE EYES AND SKIN: Contact with Phosphine on the skin will not normally cause injury; however, contact with the skin in the presence of moisture may cause irritation, due to the formation of phosphoric acid. Contact with the eyes (1-2 ppm), even briefly, will cause irritation.
HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:
ACUTE: Due to the small size of the individual cylinder of this gas mixture, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. Phosphine (a component of this gas mixture) is an extremely toxic gas; even brief over-exposures to relatively low doses may have significant health consequences. Effects of an acute over-exposure include central nervous system disorders (i.e. headaches, tremors), lung problems, abdominal pains, effects on the heart. Contact with the skin or eyes with Phosphine in the presence of moisture can cause irritation, due to the formation of phosphoric acid.
CHRONIC: Effects of chronic low level exposures to the Phosphine component of this gas mixture may result in anemia, bronchitis, gastrointestinal disorders, and visual, speech, and motor disturbances. Refer to Section 11 (Toxicology Information) for additional data. Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may affect the heart and nervous system.
TARGET ORGANS: ACUTE: Respiratory system, central nervous system, cardiac system, skin, eyes. CHRONIC: Blood system, respiratory system, gastrointestinal system, cardiac system, central nervous system.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS GAS MIXTURE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.
No unusual health effects are anticipated after exposure to this gas mixture, due to the small cylinder size. If any adverse symptom develops after over-exposure to this gas mixture, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary. 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).
SKIN EXPOSURE: If irritation of the skin develops after exposure to this gas mixture, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.
EYE EXPOSURE: If irritation of the eye develops after exposure to this gas mixture, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Seek medical assistance immediately, preferably an ophthalmologist.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Any respiratory disorder, heart condition, or central nervous system condition, may be aggravated by over-exposure to Phosphine. Additionally, skin and eye conditions may be aggravated by Phosphine exposures.
RECOMMENDATIONS TO PHYSICIANS: Administer oxygen. Victims of exposure to Phosgene must be monitored closely for delayed pulmonary edema. There is no specific antidote to Phosphine poisoning; therefore, treatment is symptomatic and supportive.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.
AUTOIGNITION TEMPERATURE: Not applicable.
FLAMMABLE LIMITS (in air by volume, %):
Lower (LEL): Not applicable.
Upper (UEL): Not applicable.
FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Phosphine is toxic to humans in relatively low concentrations, and in the concentrations present in this gas mixture, poses a potential hazard to fire-fighters. This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.



Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Not sensitive.
SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this gas mixture presents significantly less risk of over-exposure to Phosphine, an oxygen-deficient environment, and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate

immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen. A colorimetric tube is available for Phosphine. The level of Phosphine must be at acceptable levels (less than 50% of the TLV; TLV = 0.3 ppm) and Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.
If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be observant for the odor of sulfur; this odor is indicative of a potential over-exposure the Sulfur Dioxide of this gas mixture. Do not attempt to repair, adjust, or in any other way modify cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact the nearest distributor immediately. Eye wash stations/safety showers should be near areas where this gas mixture is used or stored. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. All work practices should minimize releases of Sulfur Dioxide and Nitrogen Monoxide-containing gas mixtures.
STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C [70°F]). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage. Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.
SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment is rated for proper service pressure.
PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this gas mixture in well-ventilated areas. If this gas mixture is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Phosphine and Oxygen.
RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Maintain Phosphine levels below 50% of the TLV (TLV = 0.3 ppm) and oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection when Phosphine levels exceed 50% of the TLV (TLV = 0.3 ppm), oxygen levels are below 19.5%, or during emergency response to a release of this gas mixture. During an emergency situation, before entering the area, check the concentration of Phosphine and Oxygen. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards. The following are NIOSH respiratory protection equipment recommendations for Phosphine.

PHOSPHINE

CONCENTRATION	RESPIRATORY PROTECTION
Up to 3 ppm:	Any Supplied-Air Respirator (SAR)
Up to 7.5 ppm:	Any SAR operated in a continuous-flow mode.
Up to 15 ppm:	Any Air-Purifying, Full-Face piece Respirator (gas mask) with a chin-style, front-or back-mounted canister providing protection against Phosphine, or any Self-Contained Breathing Apparatus (SCBA) with a full face piece, or any SAR with a full face piece.
Up to 50 ppm:	Any SAR operated in a pressure-demand or other positive-pressure mode.
Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions:	Any Self-Contained Breathing Apparatus (SCBA) that has a full face piece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape:	Any Air-Purifying, Full-Face piece Respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister, or any appropriate escape-type, SCBA.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.
HAND PROTECTION: Wear leather gloves when handling cylinders. Chemically resistant gloves should be worn when using this gas mixture. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.
BODY PROTECTION: No special protection is needed under normal circumstances of use. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information is for Nitrogen, the main component of this gas mixture.
GAS DENSITY @ 32°F (0°C) and 1 atm: .072 lbs/ ft3 (1.153 kg/m3)
FREEZING/MELTING POINT @ 10 psig: -345.8°F (-210°C)
BOILING POINT: -320.4°F (-195.8°C)
SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906
pH: Not applicable.
SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023
MOLECULAR WEIGHT: 28.01
EVAPORATION RATE (nBuAc = 1): Not applicable.
EXPANSION RATIO: Not applicable.

VAPOR PRESSURE @ 70°F (21.1°C) (psig): Not applicable. SPECIFIC VOLUME (ft3/lb): 13.8
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.
The following information is for this gas mixture.
ODOR THRESHOLD: 0.14 ppm (Phosphine)
APPEARANCE, ODOR AND COLOR: This gas mixture is a colorless gas which is odorless.
HOW TO DETECT THIS SUBSTANCE (warning properties): In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state. Pure Phosphine is pyrophoric; however, due to the low concentration of this component in the gas mixture, spontaneous ignition in air is not a potential hazard.
DECOMPOSITION PRODUCTS: Decomposition products of Phosphine are phosphoric acid and hydrogen. When heated to decomposition Phosphine emits toxic fumes of phosphorous oxides. Nitrogen does not decompose, per se, but can react with other compounds in the heat of a fire.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this gas mixture). Lithium reacts slowly with Nitrogen at ambient temperatures. Phosphine is not compatible with halogens or strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride).
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this gas mixture:
NITROGEN:
There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.
PHOSPHINE:
LCLo (Inhalation-Human) 1000 ppm
LC50 (Inhalation-Rat) 11 ppm/4 hours
TCLo (Inhalation-rat) 200 µg/m3/24 hours/6 weeks-continuous: Brain and Coverings: recordings from specific areas of CNS; Blood: pigmented or nucleated red blood cells, changes in serum composition (e.g. TP, bilirubin, cholesterol)
TCLo (Inhalation-rat) 3100 ppb/6 hours/13 weeks-intermittent: Blood: pigmented or nucleated red blood cells, changes in erythrocyte (RBC) count, changes in platelet count
TCLo (Inhalation-rat) 10 ppm/4 hours/4 days-intermittent: Related to Chronic Data: death
TCLo (Inhalation-mouse) 10 ppm/4 hours/4 days-intermittent: Kidney, Urethra, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Blood: changes in leukocyte (WBC) count; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: transaminases
TCLo (Inhalation-mouse) 5 ppm/4 hours/2 weeks-intermittent: Cardiac: changes in heart weight; Lungs, Thorax, or Respiration: changes in lung weight; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)
TCLo (Inhalation-rat) 5 ppm/4 hours/2 weeks-intermittent: Cardiac: changes in heart weight; Lungs, Thorax, or Respiration: changes in lung weight; Liver: changes in liver weight
LCLo (Inhalation-Mouse) 380 mg/m3/2 hours
LCLo (Inhalation-Cat, adult) 70 mg/m3/2 hours
LCLo (Inhalation-Rabbit, adult) 2500 ppm/20 minutes
LCLo (Inhalation-Guinea Pig, adult) 140 mg/m3/4 hours
LCLo (Inhalation-Mammal) 1000 ppm/5 minutes
Micronucleus Test (Inhalation-mouse) 5 ppm/6 hours/13 weeks-intermittent
SUSPECTED CANCER AGENT: The components of this gas mixture are listed by agencies tracking the carcinogenic potential of chemical compounds as follows:
PHOSPHINE: EPA-D (Not Classifiable as to Human Carcinogenicity)
The remaining component of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.
IRRITANCY OF PRODUCT: Phosphine reacts with water or moisture, slowly producing corrosive phosphoric acid; therefore, this gas mixture may be irritating to the skin, the eyes, and mucous membranes.
SENSITIZATION TO THE PRODUCT: This gas mixture is not known to cause sensitization in humans.
REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this gas mixture and its components on the human reproductive system.
Mutagenicity: No mutagenicity effects have been described for this gas mixture.
Embryotoxcity: No embryotoxic effects have been described for this gas mixture.
Teratogenicity: No teratogenicity effects have been described for this gas mixture.
Reproductive Toxicity: No reproductive toxicity effects have been described for gas mixture.
A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for the components of this gas mixture.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this gas mixture.
NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C. 1.6 volumes Nitrogen/100 volumes water at 20°C.
PHOSPHINE:
Abiotic Degradation: Pure Phosphine is inert, but will oxidize under influence of radiation and UV light.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: Due to the presence of Phosphine, this gas mixture may be harmful to over-exposed plant or animal life. Refer to Section 11 (Toxicology Information) for data on the effects of Phosphine on test animals during clinical studies.
EFFECT OF CHEMICAL ON AQUATIC LIFE: The Phosphine component of this gas mixture is soluble in water; therefore, this gas mixture may be harmful or fatal to aquatic life in contaminated bodies of water. The following are aquatic toxicity data for the Phosphine component of this gas mixture.
PHOSPHINE:
EC50 (Bacillus subtilis) 2.7 mg/L growth inhibition

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:	Compressed gases, n.o.s. (Phosphine, Nitrogen)
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1956
PACKING GROUP:	Not applicable.
DOT LABEL(S) REQUIRED:	Non-Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126
MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).
SPECIAL SHIPPING INFORMATION: 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.
Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.
TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas is considered as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME:	Compressed gases, n.o.s. (Phosphine, Nitrogen)
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1956
PACKING GROUP:	Not Applicable
HAZARD LABEL:	Class 2.2 (Non-Flammable Gas)
SPECIAL PROVISIONS:	None
EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX:	0.12
ERAP INDEX:	None
PASSENGER CARRYING SHIP INDEX:	None

PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: 75
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 121
NOTE: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:
U.S. SARA REPORTING REQUIREMENTS: This gas mixture is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Phosphine	YES	YES	YES

U.S. SARA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE THRESHOLD PLANNING QUANTITY: Phosphine = 500 lb (227 kg)
U.S. SARA SECTION 304 EXTREMELY HAZARDOUS SUBSTANCE REPORTABLE QUANTITY: Phosphine = 100 lb (45.5 kg)

U.S. TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.
U.S. CERCLA REPORTABLE QUANTITY (RQ): Phosphine = 100 lb (45.4 kg)
OTHER U.S. FEDERAL REGULATIONS:
• Phosphine is subject to the requirements of CFR 29 1910.1000 (under the 1989 PELs). Phosphine is listed on Table Z.1.
• Phosphine, is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 5,000 lb (2270 kg)
• Depending on specific operations involving the use of this gas mixture, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Phosphine is listed in Appendix A. The threshold quantity for Phosphine, under this regulation is 100 lb (45.4 kg); therefore, the requirements of this regulation are not applicable to one cylinder of this gas mixture.
• This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82).
• Nitrogen is not listed as a Regulated Substance, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Phosphine is listed in Table 1, as an extremely hazardous substance. The threshold quantity for Phosphine under this regulation is 5,000 lb (2270 kg).
OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2B, as per the Controlled Product Regulations.
U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:
Alaska - Designated Toxic and Hazardous Substances: Phosphine.
California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen, Phosphine.
Florida - Substance List: Oxygen, Phosphine.
Illinois - Toxic Substance List: Phosphine.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Oxygen, Phosphine.
Minnesota - List of Hazardous Substances: Phosphine.
Missouri - Employer Information/Toxic Substance List: Phosphine.
New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen, Phosphine.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Oxygen, Nitrogen, Phosphine.
Rhode Island - Hazardous Substance List: Oxygen, Nitrogen, Phosphine.
Texas - Hazardous Substance List: Phosphine.
West Virginia - Hazardous Substance List: Phosphine.
Wisconsin - Toxic and Hazardous Substances: Phosphine.
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this gas mixture is on the California Proposition 65 lists.
ADDITIONAL CANADIAN REGULATIONS:
CANADIAN DSL/NDSL INVENTORY STATUS: The components of this gas mixture are listed on the DSL Inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this gas mixture are not on the CEPA Priorities Substances Lists.
CANADIAN WHMIS CLASSIFICATION: This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2B, as per the Controlled Product Regulations.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.
For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content.
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.

Disclaimer: To the best of Portagas's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type either express or implied are provided. The information contained herein relates only to this specific product. Data may be changed from time to time. Be sure to consult the latest edition.