

PORTAGAS

Material Safety Data Sheet

8. EXPOSURE CONTROLS - PERSONAL PROTECTION VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents chemical dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of Chlorine and oxygen. **RESPIRATORY PROTECTION:** Maintain Chlorine levels below those described in Section 2 (Composition and Information on Ingredients) and oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% (air-purifying respirators will not function) or during emergency response to a release of this gas mixture. During an emergency situation, before entering the area, check for oxygen-deficient atmospheres. 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 NIOSH respirator recommendations are in place for Chlorine (the toxic component of this gas mixture):

CONCENTRATION

Up to 5 ppm: Use a chemical cartridge respirator or a Supplied Air Respirator (SAR).
 Up to 10 ppm: Use a SAR in the continuous flow mode, or a Powered Air Purifying Respirator (PAPR) with chlorine cartridges, or a gas mask with a chlorine canister, or a SCBA.
 For Emergencies or Entry into an Area of Unknown Chlorine Concentration: Use an SCBA or positive pressure, full-faced SAR with an auxiliary SCBA. For Escape: Use a gas mask or mouth-piece respirator with chlorine cartridges or SCBA should be used. **EYE PROTECTION:** Safety glasses or safety glasses with side shields and face shield. **HAND PROTECTION:** Wear gloves when handling cylinders of this gas mixture. Wear PVC, Teflon®, Kel-F®, or Neoprene Rubber gloves for industrial use. Use triple gloves for spill response (see Section 6, Accidental Release Measures). **BODY PROTECTION:** Use body protection appropriate for task. Safety shoes are recommended when handling cylinders.

RESPIRATORY PROTECTION

9. PHYSICAL and CHEMICAL PROPERTIES: The following information is for Nitrogen, the main component of this gas mixture. **GAS DENSITY @ 0°C (32°F) and 1 atm:** 0.072 lbs/cu ft (1.153 kg/m³)
BOILING POINT: -195.8°C (-320.4°F) **FREEZING/MELTING POINT (@ 10 psig):** -210°C (-345.8°F) **SPECIFIC GRAVITY (air = 1) @ 21.1°C (70°F):** 0.906 **pH:** Not applicable. **SOLUBILITY IN WATER vol/vol @ 0°C (32°F) and 1 atm:** 0.023 **MOLECULAR WEIGHT:** 28.01 **EVAPORATION RATE (nBuAc = 1):** Not applicable. **EXPANSION RATIO:** Not applicable. **ODOR THRESHOLD:** Not applicable. Odorless. **SPECIFIC VOLUME (ft³/lb):** 13.8 **VAPOR PRESSURE @ 21.1°C (70°F) psig:** Not applicable. **COEFFICIENT WATER/OIL DISTRIBUTION:** Not applicable. **The following information is for this gas mixture. ODOR THRESHOLD:** 0.06 ppm (detection for Chlorine) **APPEARANCE AND COLOR:** This is a clear, pungent-smelling, colorless gas mixture. **HOW TO DETECT THIS SUBSTANCE (warning properties):** The odor is a distinctive warning properties associated with this gas mixture. Additionally, leaks of gas mixtures which contain Chlorine can be detected by means of an atomizer or squeeze bottle filled with aqueous ammonia. A white cloud will show the location of the leak.

10. STABILITY and REACTIVITY STABILITY: Normally stable. **DECOMPOSITION PRODUCTS:** Chlorine, a component of this gas mixture, does not decompose, but reacts with water to form hydrogen chloride. Chlorine also reacts with carbon monoxide to form phosgene. Nitrogen, the main component of this gas mixture does not decompose, per se, but may react with other compounds in the heat of a fire. **MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** This gas mixture is not compatible with most metals (e.g., aluminum, brass, copper, manganese, tin, steel and iron). Due to the presence of Chlorine, this gas mixture is not compatible with hydrocarbons (e.g., methane, acetylene, natural or synthetic rubbers, naphtha, turpentine, gasoline, fuel gas, lubricating oil and waxes), alcohols, flammable liquids, flammable solids, and flammable gases. Nitrogen compounds, such as ammonia, can react with Chlorine to form highly explosive nitrogen trichloride. Chlorine can also react with ammonia-based compounds to form toxic chloramine gas. **HAZARDOUS POLYMERIZATION:** Will not occur. **CONDITIONS TO AVOID:** Contact with incompatible materials. Avoid exposing cylinders to extremely high temperatures, which could cause the cylinders to rupture.

11. TOXICOLOGICAL INFORMATION TOXICITY DATA: The following toxicology data are available for the components of this gas mixture present in concentrations greater than or equal to 1 mole %. **CHLORINE:** Cytogenetic Analysis System test (human, lymphocyte); 20 ppm LCLo (inhalation, human) = 2530 mg/m³/30 minutes; pulmonary effects. LCLo (inhalation, human) = 500/5 minutes LC₅₀ (inhalation, rat) = 293 ppm/1 hour LC₅₀ (inhalation, mouse) = 137 ppm/1 hour LCLo (inhalation, dog) = 800 ppm/30 minutes LCLo (inhalation, cat) = 660 ppm/4 hours LDLo (inhalation, rabbit) = 660 ppm/4 hours **NITROGEN:** There are no specific toxicology data for Nitrogen gas. Nitrogen is a simple asphyxiant (SA), which acts to displace oxygen in the environment. **SUSPECTED CANCER AGENT:** The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC, and therefore are neither considered to be or suspected to be a cancer-causing agent by these agencies. Chlorine is listed as follows: ACGIH-A4 (Not Classifiable as a Human Carcinogen). **IRRITANCY OF PRODUCT:** This gas mixture is severely irritating to skin, eyes, and other contaminated tissue. **SENSITIZATION OF PRODUCT:** This gas mixture contains no known sensitizer. **REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of this gas mixture and its components on the human reproductive system. **Mutagenicity:** Chlorine (a component of this gas mixture) has been reported to cause mutagenic effects in specific human tissues during experimental studies with exposures at relatively high doses. **Embryotoxicity:** This gas mixture is not expected to cause embryotoxic effects in humans. **Teratogenicity:** This gas mixture is not expected to cause teratogenic effects in humans. **Reproductive Toxicity:** This gas mixture is not expected to cause adverse reproductive effects in humans. *A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical that 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 that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.*

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory, dental, skin, and eye conditions may be aggravated by overexposure to this gas mixture. **RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure. Be observant for signs of pulmonary edema and other lung effects. **BIOLOGICAL EXPOSURE INDICES (BEIs):** Currently, Biological Exposure Indices (BEIs) are not applicable for the components of this gas mixture.

12. ECOLOGICAL INFORMATION ENVIRONMENTAL STABILITY: This gas mixture will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product. **NITROGEN:** Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C. 1.6 volumes Nitrogen/100 volumes water at 20°C. **EFFECT OF MATERIAL ON PLANTS or ANIMALS:** Due to the presence of Chlorine in this gas mixture, exposed animals may experience tissue damage, burns, and may be killed. Refer to Section 11 (Toxicology Information) for additional information on the components of this gas mixture and their effects on test animals. Plants contaminated with this gas mixture may be adversely effected or destroyed. **EFFECT OF CHEMICAL ON AQUATIC LIFE:** Chlorine, a component of this product, is only slightly soluble in water; however, even low aquatic concentrations are detrimental to plants and animals in a contaminated body of water life. If a release of this gas mixture occurs near a river or other body of water, the release has the potential to kill fish and other aquatic life.

13. DISPOSAL CONSIDERATIONS PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to Portagas. Do not dispose of locally. For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated area or outdoors, away from all sources of ignition.

14. TRANSPORTATION INFORMATION THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION. PROPER SHIPPING NAME: Compressed gases, n.o.s. (Nitrogen, Chlorine) **HAZARD CLASS NUMBER and DESCRIPTION:** 2.2 (Non-Flammable Gas) **UN IDENTIFICATION NUMBER:** UN 1956 **PACKING GROUP:** Not applicable. **LABEL(S) REQUIRED:** Non-Flammable Gas **NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996):** 126 **MARINE POLLUTANT:** Chlorine is designated by the Department of Transportation to be a Marine Pollutant (49 CFR 172.101, Appendix B). However, the concentration of this component is below 10% and this material is not required to be marked per the requirements of 49 CFR 192.322. **TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS.** Use above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION U.S. SARA REPORTING REQUIREMENTS: This gas mixture's components are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows:

COMPOUND	SARA 302	SARA 304	SARA 313
CHLORINE	YES	YES	YES

U.S. SARA THRESHOLD PLANNING QUANTITY: Chlorine = 100 pounds. **U.S. CERCLA REPORTABLE QUANTITIES (RQ):** Chlorine = 10 pounds (Extremely Hazardous Substance). **CANADIAN DSL INVENTORY STATUS:** The components of this gas mixture are listed on the DSL Inventory. **U.S. TSCA INVENTORY STATUS:** The components of this gas mixture are listed on the TSCA Inventory. **OTHER U.S. FEDERAL REGULATIONS:** Chlorine is subject to the reporting requirements of CFR 29 1910.1000. Chlorine is listed on Table Z.1. Chlorine is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity of Chlorine is 2500 lb. This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82). Chlorine is listed as a Regulated Substance, per 40 CFR, Part 68, of the Risk Management for Chemical Release Prevention. Under this regulation, Chlorine has a threshold quantity of 2500 lb. Depending on specific operations involving the use of this product, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Chlorine is listed in Appendix A. Under this regulation, the threshold quantity is 1500 lb. **CALIFORNIA PROPOSITION 65:** The components of this gas mixture are not on the California Proposition 65 lists. **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:** Chlorine. **California - Permissible Exposure Limits for Chemical Contaminants:** Chlorine, Nitrogen. **Florida - Substance List:** Chlorine. **Illinois - Toxic Substance List:** Chlorine. **Kansas - Section 302/313 List:** Chlorine. **Massachusetts - Substance List:** Chlorine. **Michigan - Critical Materials Register:** No. **Minnesota - List of Hazardous Substances:** Chlorine. **Missouri - Employer Information/Toxic Substance List:** Chlorine. **New Jersey - Right to Know Hazardous Substance List:** Chlorine, Nitrogen. **North Dakota - List of Hazardous Chemicals, Reportable Quantities:** Chlorine. **Pennsylvania - Hazardous Substance List:** Chlorine, Nitrogen. **Rhode Island - Hazardous Substance List:** Chlorine, Nitrogen. **Texas - Hazardous Substance List:** Chlorine. **West Virginia - Hazardous Substance List:** Chlorine. **Wisconsin - Toxic and Hazardous Substances:** Chlorine. **OTHER CANADIAN REGULATIONS:** This gas mixture is categorized as a Controlled Product, Hazard Classes A, D1A, D2A, and E, 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.**