



MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Union REACH Regulations

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	NON-FLAMMABLE MIXTURE CONTAINING: ETHYLENE IN AIR
SYNONYMS:	Not Applicable
CHEMICAL FAMILY NAME:	Not Applicable
FORMULA:	Not Applicable
PRODUCT USE:	Calibration of Monitoring and Research Equipment
DOCUMENT NUMBER:	MSDS 1057 (99-0025)
U.N. NUMBER:	UN 1956
U.N. DANGEROUS GOODS CLASS:	2.2 (Non-Flammable Gas)
SUPPLIER/MANUFACTURER'S NAME:	PortaGAS, Inc.
ADDRESS:	1202 E. Sam Houston Pkwy S., Pasadena, TX 77503
EMERGENCY PHONE:	TOLL-FREE in USA/Canada: (800)255-3924 International calls: +1 813 248 0585 Australian Poison Control: 13 11 26 Australian Fire Brigade: 000
BUSINESS PHONE:	(713) 928-6477 General MSDS Info
DATE OF PREPARATION:	October 2012
DATE OF LAST REVISION:	October 2012

SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This is a colorless, odorless, non-flammable gas mixture. The main health hazards associated with releases of this gas are related to the high pressure. This gas mixture is generally considered non-flammable; however, this gas mixture will support combustion. A cylinder rupture hazard exists when this gas mixture, which is under pressure, is subject to heat or flames.

US DOT SYMBOLS



CANADA (WHMIS) SYMBOLS



EUROPEAN and (GHS) HAZARD SYMBOLS



Signal Word: **Danger!**

EU LABELING AND CLASSIFICATION:

Classification of the substance or mixture according to Regulation (EC) No1272/2008 Annex 1 – Index# 008-001-00-8

Pressurized Gas
Oxidizing gas

According to European Directive 67/548/EEC as amended.

Harmful by inhalation;
Pressurized gas

Hazard Statement(s):

H270: May cause or intensify fire, oxidizer.
H280: Contains gas under pressure, may explode if heated.

Hazard Symbol(s):

[O] Oxidizer

Precautionary Statement(s):

P210: Keep away from heat/sparks/open flames/hot surfaces.
P261: Avoid breathing gas.
P271: Use only in well ventilated area.
P281: Use personal protective equipment as required.
P314: Get medical advice/attention if you feel unwell.
P403: Store in a well ventilated place.

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Risk Phrases:

R8: Contact with combustible material may cause fire.
R67: May cause drowsiness or dizziness.

Safety Phrases:

S9: Keep container in a well ventilated area.
S23: Do not breathe gas.
S45: In case of an accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53: Avoid exposure — obtain special instructions before use.

HEALTH HAZARDS OR RISKS FROM EXPOSURE:

ACUTE: The most significant hazard associated with gas mixture is the pressure hazard.

CHRONIC: There is currently no known adverse health effects associated with chronic exposure to this gas mixture.

TARGET ORGANS: ACUTE: None known CHRONIC: None known

SECTION 3 - COMPOSITION and INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:	CAS #	EINECS #	ICSC #	% Vol	HAZARD CLASSIFICATION; RISK PHRASES
Ethylene	74-85-1	200-815-3	Not Listed	<1.9%	HAZARD CLASSIFICATION: [F] Flammable RISK PHRASES: R12, R67
Air	132259-10-0	Not Listed	Not Listed	Balance	HAZARD CLASSIFICATION: [O] Oxidizer RISK PHRASES: R8
Air is a mixture of gases as listed below:					
Oxygen	7782-44-7	231-956-9	Not Listed	21%	HAZARD CLASSIFICATION: [O] Oxidizer RISK PHRASES: R8
Nitrogen	7727-37-9	231-783-9	Not Listed	79%	HAZARD CLASSIFICATION: None RISK PHRASES: None
None of the trace impurities in this product contribute significantly to the hazards associated with the product. All hazard information pertinent to the product has been provided in this Material Safety Data sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards					

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard JIS Z 7250: 2000.

SECTION 4 - FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, **Self-Contained Breathing Apparatus may be needed.** The opportunity for injury from this gas mixture is limited to over-pressure accidents, which can occur after the rapid release of the gas from the cylinder. In the event of such accidents, seek immediate and qualified medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT:

Non-Flammable

AUTOIGNITION TEMPERATURE:

Not Applicable

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not Applicable Upper (UEL): Not Applicable

FIRE EXTINGUISHING MATERIALS: Non-flammable gas. Use extinguishing media appropriate for surrounding fire. In the event of fire, cool containers of this product with water to prevent failure. Use a water spray or fog to reduce or direct vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture will not burn; however, it will support combustion of flammable materials. Cylinders, when involved in a fire, may rupture or burst in the heat of the fire.

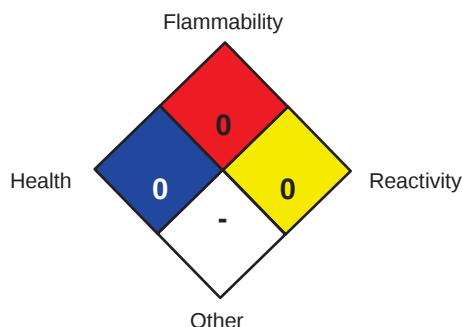
Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive

SPECIAL FIRE-FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment.

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NFPA RATING SYSTEM



HMIS RATING SYSTEM

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD (BLUE)			0
FLAMMABILITY HAZARD (RED)			0
PHYSICAL HAZARD (YELLOW)			0
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Sect 8		See Sect 8
For Routine Industrial Use and Handling Applications			

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

SECTION 6 - ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment should be **Level D: safety glasses**. Locate and seal the source of the leaking gas. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there. If leaking incidentally from the cylinder or its valve, contact your supplier.

SECTION 7 - HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: Though this gas mixture contains sufficient oxygen to sustain life, it must be treated as unfit for human consumption and should not be used in applications requiring breathing air.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored upright (with valve-protection cap in place) and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Cylinders should be stored in dry, well-ventilated areas away from sources of heat, ignition, and direct sunlight. Keep storage area clear of materials that can burn. Do not allow area where cylinders are stored to exceed 52°C (125°F). Store containers away from heavily trafficked areas and emergency exits. Store away from process and gas production areas, elevators, building and room exits, or main aisles leading to exits. Protect cylinders against physical damage. Keep the smallest amount on-site as is necessary. 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. Use a check valve in the discharge line to prevent hazardous backflow. Never tamper with pressure relief devices in valves and cylinders.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap (where provided) in-place until cylinder is ready for use. **During Use:** Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Do not use oils or grease on gas-handling fittings or equipment. Leak-check system with leak detection solution, never with flame. Immediately contact the supplier if there are any difficulties associated with operating cylinder valve. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc, on a compressed gas cylinder or make a cylinder part of an electric circuit. **After Use:** Close main cylinder valve. Replace valve protection cap. Mark empty cylinders "EMPTY". **NOTE:** Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (i.e. nitrogen) before attempting repairs. Always use product in areas where adequate ventilation is provided.

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SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/GUIDELINES:

Chemical Name	CAS#	ACGIH TWA	OSHA TWA	SWA
Ethylene	74-85-1	Simple Asphyxiant	Simple Asphyxiant	Simple Asphyxiant
Air	132259-10-0	Not Listed	Not Listed	Not Listed

Currently, International exposure limits are not established for the components of this product. Please check with competent authority in each country for the most recent limits in place.

VENTILATION AND ENGINEERING CONTROLS: None needed.

RESPIRATORY PROTECTION: None needed. If respiratory protection is required, follow the requirements of the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, or the applicable regulations of Canada and its Provinces.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: Wear gloves when handling cylinders of this gas mixture. Otherwise, wear glove protection appropriate to the specific operation for which this gas mixture is used. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate for task. Safety shoes are recommended when handling cylinders.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

The following information is for Air, the main component of this gas mixture.

GAS DENSITY@32°F (0°C) and 1 atm:	0.07493 lb/ ft ³ (1.2 kg/m ³)
BOILING POINT:	-194.3°C (-317.8°F)
FREEZING/MELTING POINT (@ 10 psig):	-216.2°C (-357.2°F)
SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C):	1
pH:	Not applicable.
SOLUBILITY IN WATER vol/vol at 32°F (0°C) and 1 atm:	0.0292
MOLECULAR WEIGHT:	28.975
EVAPORATION RATE (nBuAc = 1):	Not applicable.
EXPANSION RATIO:	Not applicable.
ODOR THRESHOLD:	Not applicable. Odorless.
SPECIFIC VOLUME (ft³/lb):	Not applicable for Air
VAPOR PRESSURE @ 70°F (21.1°C) (psig):	Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION:	Not applicable.
APPEARANCE, ODOR AND COLOR:	Colorless, odorless gas mixture.
HOW TO DETECT THIS SUBSTANCE (warning properties):	There are no unusual warning properties associated with a release of this product.

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Normally stable

DECOMPOSITION PRODUCTS: Ethylene will decompose into carbon dioxide and carbon monoxide at extremely high temperatures. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Ethylene: Reacts violently with AlCl₃, O₃, CCl₄, benzoyl peroxide, bromotrichloromethane, and nitromethane with AlCl₃.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Cylinders exposed to high temperatures or direct flame can rupture or burst.

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SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICITY DATA: No data available for this product:

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: U.S. FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases can cause frostbite and damage to exposed skin and eyes.

SENSITIZATION OF PRODUCT: The components of this gas mixture are 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. Embryotoxicity: 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.

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

CHEMICAL DETERMINANT	SAMPLING TIME	BEI

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No adverse effect is anticipated to occur to animals or plant-life, except for frost produced in the presence of rapidly expanding gases.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence of an adverse effect of this gas mixture on aquatic life is currently available.

SECTION 13 - DISPOSAL CONSIDERATIONS

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

SECTION 14 - TRANSPORTATION INFORMATION

US DOT: IATA: IMO: ADR:

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

PROPER SHIPPING NAME: Compressed gases, n.o.s. (Air, Ethylene)

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not applicable.

DOT LABEL(S) REQUIRED: Class 2.2 (Non-Flammable Gas)

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as a Marine Pollutant (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 present serious safety hazards and should be discouraged.

NOTE: Shipment of compressed gas cylinders which have not been filled with the owner's consent is a violation of Federal law (49 CFR, Part 173.301 (b))

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:

This product is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:

This product is classified as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME:

Compressed gases, n.o.s. (Air, Ethylene)

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)

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SPECIAL PROVISIONS: NA
EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX: NA
ERAP INDEX: NA
PASSENGER CARRYING SHIP INDEX: NA
PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: NA
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): 126

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)

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):

This product is classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:

This product is classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):

This product is classified by the United Nations Economic Commission for Europe to be dangerous goods.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES REGULATIONS

SARA REPORTING REQUIREMENTS: This gas is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows: None

TSCA: All components in this product are listed on the US Toxic Substances Control Act (TSCA) inventory of chemicals.

SARA 311/312:

Acute Health: Yes Chronic Health: No Fire: No Reactivity: No

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this gas. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable

OTHER U.S. FEDERAL REGULATIONS: None known

U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances:	Ethylene
California - Permissible Exposure Limits for Chemical Contaminants:	Ethylene
Florida - Substance List:	No
Illinois - Toxic Substance List:	Ethylene
Kansas - Section 302/313 List:	No
Massachusetts - Substance List:	Ethylene
Michigan - Critical Materials Register:	No
Minnesota - List of Hazardous Substances:	Ethylene
Missouri - Employer Information/Toxic Substance List:	Ethylene
New Jersey - Right to Know Hazardous Substance List:	Ethylene
North Dakota - List of Hazardous Chemicals, Reportable Quantities:	No
Pennsylvania - Hazardous Substance List:	Ethylene
Rhode Island - Hazardous Substance List:	No
Texas - Hazardous Substance List:	No
West Virginia - Hazardous Substance List:	No
Wisconsin - Toxic and Hazardous Substances:	No

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The components of this gas mixture are not on the California Proposition 65 lists.

CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: All of the components of this product are on the DSL Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This gas mixture is categorized as a Controlled Product, Hazard Classes A, as per the Controlled Product Regulations.

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EUROPEAN ECONOMIC COMMUNITY INFORMATION:

EU LABELING AND CLASSIFICATION: Classification of the substance or mixture according to Regulation (EC) No1272/2008. See section 2 for details.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: All components of this product are listed on the AICS.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:

Listing of the components on individual country Chemical Inventories is as follows:

Asia-Pac:	Listed
Australian Inventory of Chemical Substances (AICS):	Listed
Korean Existing Chemicals List (ECL):	Listed
Japanese Existing National Inventory of Chemical Substances (ENCS):	Listed
Philippines Inventory of Chemicals and Chemical Substances (PICCS):	Listed
Swiss Giftliste List of Toxic Substances:	Listed
U.S. TSCA:	Listed

SECTION 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 mixture 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.

PREPARED BY: Paul Eigbrett Global Safety Management, 10006 Cross Creek Blvd. Suite 440, Tampa, FL 33647

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