

# MATERIAL SAFETY DATA SHEET

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## **PART I** *What is the material and what do I need to know in an emergency?*

### 1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: **ETHANE - C<sub>2</sub>H<sub>6</sub>, GASEOUS**  
**ETHANE - C<sub>2</sub>H<sub>6</sub>, LIQUEFIED (Cryogenic)**  
 Document Number: 001024  
PRODUCT USE: For General Analytical/Synthetic Chemical Uses

SUPPLIER/MANUFACTURER'S NAME:

**TAIYU INDUSTRIAL GASES Limited**  
**16/F, Kowloon building, 555**  
**Nathan Road, Mongkok Kowloon,**  
**Hong Kong**  
**TELEPHONE NUMBER: (852)22979277**

**Chengdu Taiyu Industrial Gases Co.,Ltd**  
**Chengluo Avenue, Longquan District,**  
**Chengdu City, China (Mainland)**  
**TELEPHONE NUMBER: (86) 28-88455212(commonly)**

### 2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIHTLV		OSHA-PEL		NIOSH IDLH ppm	OTHER ppm
			TWA ppm	STEL ppm	TWA ppm	STEL ppm		
Ethane	74-84-0	> 95.0	NIC = 1000	There are no specific exposure limits for Ethane. Ethane is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.				
Maximum Impurities		< 5.0	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this 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.					

NE = Not Established.      NIC = Notice of Intended Change      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:** Ethane is a colorless, flammable gas or a colorless, flammable cryogenic liquid. The gas or liquid may have a mild gasoline-like odor. The liquid rapidly boils to a gas at standard atmospheric temperatures and pressures. Ethane is an asphyxiant and presents a significant health hazard by displacing the oxygen in the atmosphere. Both the liquid and gas pose a serious fire hazard when accidentally released. The gas is heavier than air and may spread long distances. Distant ignition and flashback are possible. Contact with liquid or rapidly expanding gases may cause frostbite. Flame or high temperature impinging on a localized area of the cylinder of Ethane can cause the cylinder to rupture without activating the cylinder's relief devices. Provide adequate fire protection during emergency response situations.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

### 3. HAZARD IDENTIFICATION (Continued)

**INHALATION:** High concentrations of this gas can cause an oxygen-deficient environment. 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 skin of a victim may have a blue color. Under some circumstances, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION	SYMPTOMS OF EXPOSURE
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 and vomiting, collapse or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.



**OTHER POTENTIAL HEALTH EFFECTS:** Contact with the cryogenic liquid or rapidly expanding gases may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact can quickly subside.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE:** An **Explanation in Lay Terms.** Overexposure to Ethane may cause the following health effects:

**ACUTE:** The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness and nausea. At high concentrations, unconsciousness or death may occur. Contact with cryogenic liquid or rapidly expanding gases may cause frostbite.

**CHRONIC:** Ethane is considered a weak heart sensitizing agent, based on animal tests. Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may affect the heart and nervous system.

**TARGET ORGANS:** ACUTE: Respiratory system. CHRONIC: Central nervous system, heart.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD		(BLUE)	1
FLAMMABILITY HAZARD		(RED)	4
PHYSICAL HAZARD		(YELLOW)	0
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For Routine Industrial Use and Handling Applications			

**See Section 16 for Definition of Ratings**

## PART II *What should I do if a hazardous situation occurs?*

### 4. FIRST-AID MEASURES

**RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO ETHANE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations.**

Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen. Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Pre-existing respiratory conditions may be aggravated or adversely effected by overexposure to Nitrous Oxide.

**RECOMMENDATIONS TO PHYSICIANS:** Provide oxygen, treat symptoms, and reduce overexposure. Cryogenic dermal injuries should be treated by water bath re-warming at 40 to 42°C until vasodilatory flush has returned. Elevation of the limb and standard frostbite management with late surgical debridement should be utilized. Ocular exposure requires irrigation and slit-lamp evaluation for injury.

### 5. FIRE-FIGHTING MEASURES

**FLASH POINT (Closed Cup):** -135°C (-211°F)

**AUTOIGNITION TEMPERATURE:** 515°C (959°F)

**FLAMMABLE LIMITS (in air by volume, %):**

**Lower (LEL):** 3.0%

**Upper (UEL):** 12.5%

## 5. FIRE-FIGHTING MEASURES (Continued)

**FIRE EXTINGUISHING MATERIALS:** Extinguish Ethane fires by shutting off the source of the gas. Use water spray or a foam agent to cool fire-exposed containers, structures, and equipment.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** When involved in a fire, this material ignites to produce toxic gases including carbon monoxide and carbon dioxide.

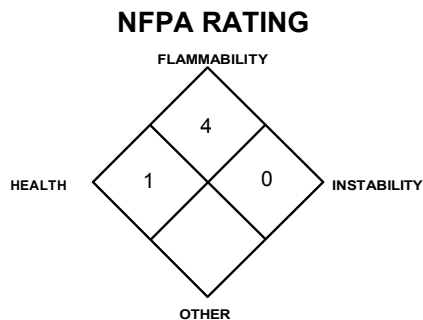
**DANGER!** Fires impinging (direct flame) on the outside surface of unprotected pressure storage vessels of Ethane can be very dangerous. Direct flame exposure on the cylinder wall can cause an explosion by exothermic decomposition. This is a catastrophic failure of the vessel releasing the contents into a massive fireball and explosion. The resulting fire and explosion can result in severe equipment damage and personnel injury or death over a large area around the vessel. For massive fires in large areas, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and allow fire to burn.

**RESPONSE TO FIRE INVOLVING CRYOGEN:** Cryogenic liquids can be particularly dangerous during fires because of their potential to rapidly freeze water. Careless use of water may cause heavy icing. Furthermore, relatively warm water greatly increases the evaporation rate of Ethane. If large concentrations of Ethane gas are present, the water vapor in the surrounding air will condense, creating a dense fog that may make it difficult to find fire exits or equipment. Liquid Ethane, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release. A flammable mixture will exist within the vapor cloud, and it is advisable that personnel keep well outside the area of visible moisture.

**Explosion Sensitivity to Mechanical Impact:** Not sensitive.

**Explosion Sensitivity to Static Discharge:** Static discharge may cause Ethane to ignite explosively if released.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Because of the potential for a BLEVE, evacuation of non-emergency personnel is essential. If water is not available for cooling or protection of vessel exposures, evacuate the area. Refer to the North American Emergency Response Guidebook for further information.



**See Section 16 for  
Definition of Ratings**

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## 6. ACCIDENTAL RELEASE MEASURES

**SPILL AND 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 and protect people. Adequate fire protection must be provided. Minimum Personal Protective Equipment should be **Level B: fire-retardant protective clothing, gloves, and Self-Contained Breathing Apparatus**. Use only non-sparking tools and equipment. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas to dissipate. Monitor the surrounding area for combustible gas levels and oxygen. Combustible gas concentration must be below 10% of the LEL (LEL = 3.0%) prior to entry of response personnel. The atmosphere must have at least 19.5% oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. 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.

**RESPONSE TO CRYOGENIC RELEASE:** Clear the affected area and allow the liquid to evaporate and the gas to dissipate. After the gas is formed, follow the instructions provided in the previous paragraph. If the area must be entered by emergency personnel, SCBA, Kevlar gloves, and appropriate foot and leg protection must be worn.

**THIS IS AN EXTREMELY FLAMMABLE GAS.** Protection of all personnel and the area must be maintained.

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## **PART III**    *How can I prevent hazardous situations from occurring?*

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### 7. HANDLING and STORAGE

**WORK PRACTICES AND HYGIENE PRACTICES:** As with all chemicals, avoid getting Ethane IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Ethane could occur without any significant warning symptoms.

**STORAGE AND HANDLING PRACTICES:** Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post "No Smoking or Open Flames" signs in storage or use areas.

**SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS:** Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat, ignition, and direct sunlight. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from oxidizers such as oxygen, chlorine, or fluorine. Use a check valve or trap in the discharge line to prevent hazardous backflow.

## 7. HANDLING and STORAGE (Continued)

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS (continued): Post "No Smoking or Open Flame" signs in storage and use areas. Cylinders should be stored upright 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. Never tamper with pressure relief devices in valves and cylinders. Electrical equipment should be non-sparking or explosion-proof. The following rules are applicable to work situations in which cylinders are being used:

**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 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. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

**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. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 "Oxygen Deficient Atmospheres" and NFPA Bulletin 58.

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. Purge gas handling equipment with inert gas (e.g., nitrogen) before attempting repairs.

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## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents Ethane dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the presence of potentially explosive air-gas mixtures and the level of oxygen.

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

EYE PROTECTION: Splash goggles or safety glasses, for protection from rapidly expanding gases and splashes of liquid Ethane. Additionally, face shields should be worn for Liquid Ethane use. If necessary, refer to U.S. OSHA 29 CFR 1910.133, or Canadian Standards.

HAND PROTECTION: Wear mechanically resistant-gloves when handling cylinders of Ethane. Use low-temperature protective gloves (e.g., Kevlar) when working with containers of Liquid Ethane. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well as fire retardant items. 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.

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## 9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: 1.242 kg/m<sup>3</sup> (0.0799 lb/ft<sup>3</sup>)

SPECIFIC GRAVITY (air =1): 1.048

SOLUBILITY IN WATER: Very slight.

EVAPORATION RATE(nBuAc = 1): Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

ODOR THRESHOLD: Not established.

APPEARANCE, ODOR AND COLOR: Colorless gas. The cryogenic liquid is also colorless. Both the liquid and gas may also have a faint gasoline-like odor at high concentration.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no distinct 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.

pH: Not applicable.

FREEZING POINT: -183.1°C (-297.9°F)

BOILING POINT @ 1 atm: -88.6°C (-127.5°F)

EXPANSION RATIO: 437 (cryogenic liquid)

SPECIFIC VOLUME (ft<sup>3</sup>/lb): 12.8

VAPOR PRESSURE (psig): 543

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## 10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: When ignited in the presence of oxygen, this gas will burn to produce carbon monoxide, carbon dioxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers (e.g., chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials and exposure to heat, sparks, and other sources of ignition.

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## **PART IV** *Is there any other useful information about this material?*

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### 11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following information is for pure Ethane.

ETHANE: Guinea pigs breathing about 2.2 to 5% Ethane for 2 hours showed signs of irregular breathing and slight drowsiness, but no other health effects. At concentrations of 15-19%, when mixed with oxygen, Ethane is a weak cardiac sensitizer. There were no signs of anesthesia in animals breathing an ethane/oxygen mixture (80% ethane/20% oxygen) for up to 3.75 hours.

SUSPECTED CANCER AGENT: Ethane is not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore is neither considered to be nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Ethane is not irritating; however, contact with rapidly expanding gases can cause frostbite to exposed tissue.

SENSITIZATION TO THE PRODUCT: Ethane is not known to cause sensitization in humans; however, some animal studies indicate that exposure to Ethane can cause weak cardiac sensitization.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects Ethane on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for Ethane.

Embryotoxicity: No embryotoxic effects have been described for Ethane.

Teratogenicity: No teratogenicity effects have been described for Ethane.

Reproductive Toxicity: No reproductive toxicity effects have been described for Ethane.

*A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational 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, there are no Biological Exposure Indices for Ethane.

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### 12. ECOLOGICAL INFORMATION

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

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

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on Ethane's effects on aquatic life.

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### 13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Product removed from the cylinder must be disposed of in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada and its Provinces. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

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### 14. TRANSPORTATION INFORMATION

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

**For Ethane Gas:**

PROPER SHIPPING NAME: Ethane

HAZARD CLASS NUMBER and DESCRIPTION: 2.1 (Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1035

PACKING GROUP: Not Applicable

DOT LABEL(S) REQUIRED: Class 2.1 (Flammable Gas)

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 115

## 14. TRANSPORTATION INFORMATION

### U.S. DEPARTMENT OF TRANSPORTATION INFORMATION (continued).

#### **For Liquefied Ethane:**

PROPER SHIPPING NAME: Ethane, refrigerated liquid  
HAZARD CLASS NUMBER and DESCRIPTION: 2.1 (Flammable Gas)  
UN IDENTIFICATION NUMBER: UN 1961  
PACKING GROUP: Not Applicable  
DOT LABEL(S) REQUIRED: Class 2.1 (Flammable Gas)  
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 115  
MARINE POLLUTANT: Ethane is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas is considered as Dangerous Goods, per regulations of Transport Canada. The use of the above U.S. DOT information from the U.S. 49 CFR regulations is allowed for shipments that originate in the U.S. For shipments via ground vehicle or rail that originate in Canada, the following information is applicable.

#### **For Ethane Gas:**

PROPER SHIPPING NAME: Ethane  
HAZARD CLASS NUMBER and DESCRIPTION: Class 2.1 (Flammable Gas)  
UN IDENTIFICATION NUMBER: UN 1035  
PACKING GROUP: Not Applicable  
HAZARD LABEL(S) REQUIRED: Class 2.1 (Flammable Gas)  
SPECIAL PROVISIONS: 16  
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX: 0.12  
ERAP INDEX: 3000  
PASSENGER CARRYING SHIP INDEX: Forbidden  
PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX: Forbidden  
MARINE POLLUTANT: Components of this gas mixture are not Marine Pollutants

#### **For Liquefied Ethane:**

PROPER SHIPPING NAME: Ethane, refrigerated liquid  
HAZARD CLASS NUMBER and DESCRIPTION: Class 2.1 (Flammable Gas)  
UN IDENTIFICATION NUMBER: UN 1961  
PACKING GROUP: Not Applicable  
HAZARD LABEL(S) REQUIRED: Class 2.1 (Flammable Gas)  
SPECIAL PROVISIONS: 16  
EXPLOSIVE LIMIT & LIMITED QUANTITY INDEX: 0.12  
ERAP INDEX: 3000  
PASSENGER CARRYING SHIP INDEX: Forbidden  
PASSENGER CARRYING ROAD OR RAIL VEHICLE INDEX: Forbidden  
MARINE POLLUTANT: Components of this gas mixture are not Marine Pollutants

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## 15. REGULATORY INFORMATION

### **ADDITIONAL U.S. REGULATIONS:**

U.S. SARA REPORTING REQUIREMENTS: Ethane is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this material. 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. TSCA INVENTORY STATUS: Ethane is listed on the TSCA Inventory.

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

OTHER U.S. FEDERAL REGULATIONS: Ethane is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 lb (4540 kg). Depending on specific operations involving the use of Ethane, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Ethane is not listed in Appendix A, however, any process that involves a flammable gas on-site, in one location, in quantities of 10,000 lb (4540 kg) or greater is covered under this regulation unless it is used as a fuel.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Ethane is not on the California Proposition 65 lists.

CGA LABELING (for Compressed Gas):

**DANGER:** FLAMMABLE LIQUID AND GAS UNDER PRESSURE.  
CAN FORM EXPLOSIVE MIXTURES WITH AIR.  
MAY CAUSE FROSTBITE.

## 15. REGULATORY INFORMATION (Continued)

### ADDITIONAL U.S. REGULATIONS (continued):

#### CGA LABELING (for Compressed Gas) [continued]:

Keep away from heat, flames, and sparks.  
Store and use with adequate ventilation.  
Cylinder temperature should not exceed 52°C (125°F).  
Avoid breathing gas.  
Do not get liquid in eyes, on skin or clothing.  
Close valve after each use and when empty.  
Use in accordance with the Material Safety Data Sheet.

**FIRST-AID:** **IF INHALED**, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**IN CASE OF FROSTBITE**, obtain immediate medical attention.

DO NOT REMOVE THIS PRODUCT LABEL

### ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY: Ethane is listed on the DSL Inventory.

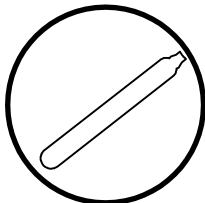
OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: Ethane is not on the CEPA Priorities Substances Lists.

#### CANADIAN WHMIS CLASSIFICATION AND SYMBOLS:

**Class A:** Compressed Gas

**Class B1:** Flammable Gas



The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Airgas, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Taiyu Gases. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.