

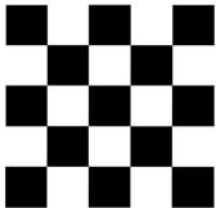
**MATERIAL SAFETY DATA SHEET**

PRODUCT NAME: NATURAL GAS REFERENCE STANDARDS  
(GPA GAS REFERENCE, HIGH HELIUM, AND HIGH ETHANE)

**1. Product and Company Identification**

**INDIANA  
OXYGEN**

AS PACKAGED  
AND DISTRIBUTED  
BY



**INDIANA OXYGEN COMPANY  
6099 WEST CORPORATE WAY  
INDIANAPOLIS, INDIANA 46278  
PHONE 1-317-290-0003**

**Emergency Contact: Infotrak  
1-800-535-5053**

**PRODUCT NAME:** Natural Gas Reference Standards – GPA Gas Reference, High Helium, and High Ethane  
**CHEMICAL NAME:** Mixture  
**COMMON NAMES/SYNONYMS:** None  
**TDG (Canada) CLASSIFICATION:** 2.1  
**WHMIS CLASSIFICATION:** A, B1

**PREPARED BY:** Loss Control (908)464-8100/(905)501-1700  
**PREPARATION DATE:** 7/14/00  
**REVIEW DATES:** 11/8/02

**2. Composition, Information on Ingredients**

**EXPOSURE LIMITS<sup>1</sup>:**

INGREDIENT	% VOLUME	PEL-OSHA <sup>2</sup>	TLV-ACGIH <sup>3</sup>	LD <sub>50</sub> or LC <sub>50</sub> Route/Species
Methane FORMULA: CH <sub>4</sub> CAS: 74-82-8 RTECS #: PA1490000	62-93	None Established	Simple Asphyxiant	Not Available
Ethane FORMULA: C <sub>2</sub> H <sub>6</sub> CAS: 74-84-0 RTECS #: KH3800000	3-11	None Established	Simple Asphyxiant	Not Available
Nitrogen FORMULA: N <sub>2</sub> CAS: 7727-37-9 RTECS #: QW9700000	1-9	None Established	Simple Asphyxiant	Not Available
Propane FORMULA: C <sub>3</sub> H <sub>8</sub> CAS: 74-98-6 RTECS #: SE7545000	1-7	1000 ppm	Simple Asphyxiant	Not Available
Isobutane FORMULA: C <sub>4</sub> H <sub>10</sub> CAS: 75-28-5 RTECS #: TZ4300000	1-3	None Established	800 ppm	Not Available

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INGREDIENT	% VOLUME	PEL-OSHA <sup>2</sup>	TLV-ACGIH <sup>3</sup>	LD <sub>50</sub> or LC <sub>50</sub> Route/Species
n-Butane FORMULA: C <sub>4</sub> H <sub>10</sub> CAS: 106-97-8 RTECS #: EJ4300000	1-3	None Established	800 ppm TWA	LC <sub>50</sub> : 276,000 ppm inhalation/rat (4 H)
Helium FORMULA: He CAS: 7440-59-7 RTECS #: MH6520000	≤ 2	None Established	Simple Asphyxiant	Not Available
Isopentane FORMULA: C <sub>5</sub> H <sub>12</sub> CAS: 78-78-4 RTECS #: EK4430000	≤ 1	1000 ppm TWA	600 ppm TWA	LC <sub>50</sub> : 140,000 ppm inhalation/mouse (2 H)
n-Pentane FORMULA: C <sub>5</sub> H <sub>12</sub> CAS: 1096-65-0 RTECS #: RZ9450000	≤ 1	1000 ppm TWA	600 ppm TWA	LC <sub>50</sub> : 123,000 ppm inhalation/rat (4 H)
Carbon dioxide FORMULA: CO <sub>2</sub> CAS: 124-38-9 RTECS #: FF6400000	≤ 1	5000 ppm TWA	5000 ppm TWA 30,000 ppm STEL	Not Available

<sup>1</sup> Refer to individual state or provincial regulations, as applicable, for limits which may be more stringent than those listed here.

<sup>2</sup> As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

<sup>3</sup> As stated in the ACGIH 2002 Threshold Limit Values for Chemical Substances and Physical Agents.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

### 3. Hazards Identification

#### EMERGENCY OVERVIEW

Colorless flammable gas with slight petroleum odor. Dangerous fire and explosion hazard. Avoid heat, sparks and flames. The majority of this product consists of simple asphyxiants which displace oxygen necessary to support life. Release in confined area may cause suffocation. Simple hydrocarbons may cause irritation and central nervous system depression at high concentrations. Maintain oxygen levels above 19.5%. Contents under pressure. Use and store below 125 °F.

#### ROUTE OF ENTRY:

Skin Contact No	Skin Absorption No	Contact No	Inhalation Yes	Ingestion No
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#### HEALTH EFFECTS:

Exposure Limits Yes	Irritant No	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects None reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

**EYE EFFECTS:** May cause minor irritation at high concentrations.

**SKIN EFFECTS:** Repeated or prolonged contact may cause irritation.

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**INGESTION EFFECTS:** None known. Ingestion is unlikely.

**INHALATION EFFECTS:** High concentrations may irritate the eyes and mucous membranes. Methane, ethane, nitrogen, propane, and helium act as simple asphyxiants. Exposure to high concentrations of this gas mixture may exclude an adequate supply of oxygen. High concentrations of simple hydrocarbons present in this mixture may have a narcotic effect. Overexposure to hydrocarbons is expected before overexposure to carbon dioxide.

Narcotic effects may include dizziness, incoordination, sleepiness, and unconsciousness. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgement, depression of all sensations, emotional instability, and fatigue. If victim is not removed from exposure, unconsciousness may result eventually leading to convulsions, coma, and death.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** None known.

**POTENTIAL ENVIRONMENTAL EFFECTS:** Ecotoxicity values were unavailable. Toxic effects are expected to be similar to those seen in humans and test animals.

#### 4. First Aid Measures

**EYES:** If irritation occurs, rinse eyes thoroughly with lukewarm water. If irritation persists, seek medical attention.

**SKIN:** If irritation occurs, wash skin thoroughly with soap and water.

**INGESTION:** Not normally required.

**INHALATION:** PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS PRODUCT. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. Keep victim warm and quiet.

#### 5. Fire Fighting Measures

Conditions of Flammability: Flammable gas		
Flash point: Gas	Method: Not Applicable	Autoignition Temperature: No Data
LEL(%): No Data*		UEL(%): No Data*
Hazardous combustion products: Carbon dioxide, Carbon monoxide		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: Not Available		

\* The LELs for the flammable components in this mixture range from 1.4 (n-pentane) to 5.0 (methane). The UELs for the flammable components in this mixture range from 7.6 (n-pentane) to 15 (methane).

**FIRE AND EXPLOSION HAZARDS:** Flammable gas. Cylinder may vent rapidly or rupture violently from pressure when involved in a fire situation.

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**EXTINGUISHING MEDIA:** Carbon dioxide, dry chemical or water spray.

**FIRE FIGHTING INSTRUCTIONS:** If possible, stop the flow of gas. Inerting the atmosphere to reduce oxygen levels may extinguish flame, allowing capping of leaking container. Do not attempt this unless specifically trained. Reduce the rate of flow and inject an inert gas, if possible, before completely stopping the flow to prevent flashback. Do not extinguish the fire until the supply is shut off as otherwise an explosive re-ignition may occur. If the fire is extinguished and the flow of gas continues, use increased ventilation to prevent build-up of explosive atmosphere. Use non-sparking tools to close container valves.

Use water spray to cool surrounding containers. Be cautious of a Boiling Liquid Evaporating Vapor Explosion, BLEVE, if flame is impinging on surrounding containers. Direct 500 GPM water stream onto containers above liquid level with remote monitors. Limit the number of personnel in proximity of fire and evacuate surrounding areas in all directions.

Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear. Continue to cool fire-exposed cylinders until well after flames are extinguished.

## 6. Accidental Release Measures

Immediately extinguish all ignition sources. No smoking, flames, sparks or flares in hazard area. Evacuate all personnel from affected area. Use appropriate protective equipment (See Section 8). Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. Ventilate enclosed areas. Provide maximum explosion-proof ventilation. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

## 7. Handling and Storage

**Electrical Classification:** Not Available

Earth ground and bond all lines and equipment associated with the system. All equipment should be non-sparking or explosion-proof. Methane is non-corrosive and may be used with any common structural material.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Do not insert any object (i.e.: screwdriver) into valve cap openings as this can damage the valve causing leakage.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Post "NO SMOKING" signs in use or storage areas. There should be no source for accidental ignition in areas where this product is being used or stored. Outside or detached storage is preferred.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14, and Safety Bulletin SB-2.

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**Revised:** 11/8/02

## 8. Exposure Controls, Personal Protection

**ENGINEERING CONTROLS:** Use local exhaust and general ventilation systems to prevent build up of flammable concentrations. Small quantities can be handled in forced ventilation hoods. If product is handled routinely where the potential for leaks exists, all electrical equipment must be rated for use in potentially flammable atmospheres. Consult the National Electrical Code for details.

**EYE/FACE PROTECTION:** Safety goggles or glasses.

**SKIN PROTECTION:** Protective gloves of suitable material as necessary to prevent exposure.

**RESPIRATORY PROTECTION:** For emergency release use a positive pressure NIOSH approved air-supplying respirator systems (SCBA or airline/escape bottle) using at a minimum Grade D air.

**OTHER/GENERAL PROTECTION:** Safety shoes.

## 9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Not Available	
Vapor density (Air = 1)	: Not Available	
Evaporation point	: Not Available	
Boiling point (for ethane)	: -285.7	°F
	: -161.5	°C
Freezing point (for ethane)	: -296.5	°F
	: -182.5	°C
pH	: Not Applicable	
Specific gravity (for ethane)	: 0.55	
Oil/water partition coefficient	: Not Available	
Solubility (H <sub>2</sub> O)	: Negligible	
Odor threshold	: No Data	
Odor and appearance	: Colorless gas with slight petroleum odor	

## 10. Stability and Reactivity

**STABILITY:** Stable

**INCOMPATIBLE MATERIALS/CONDITIONS:** Incompatible with oxidizers. Avoid heat, sparks, and flames.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Carbon oxides.

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## 11. Toxicological Information

**INHALATION:** In humans, pentane has caused slight dizziness in humans at concentrations of 5000 ppm (10 minute exposure) but no noticeable nose, eye or respiratory irritation. Individuals exposed to 10,000 ppm (1%) butane for 10 minutes exhibited drowsiness but no systemic effects. The ACGIH TLV for carbon dioxide of 5,000 ppm is expected to provide a good margin of safety from asphyxiation and undue metabolic stress provided sufficient oxygen levels are maintained in the air. Increased physical activity, duration of exposure, and decreased oxygen content can affect systemic and respiratory effects resulting from exposure to carbon dioxide.

**SKIN AND EYE:** May cause minor eye irritation.

**OTHER:** Long-term adverse effects have been noted for mixtures containing pentane and other volatile hydrocarbons (polyneuropathy). Similar effects have not been reported for pure pentane or butane. Pentane in solvent mixtures may potentiate hexacarbon neuropathy possibly due to smaller amounts of n-hexane and MBK present.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals. Chronic, harmful effects are not known from repeated inhalation of low (3 to 5 molar %) concentrations of carbon dioxide.

## 12. Ecological Information

Product does not contain Class I or Class II ozone depleting substances. See Section 3 for ecotoxicity data. Not expected to bioconcentrate.

## 13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

## 14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Compressed gas, flammable, n.o.s. (methane, ethane)	Compressed gas, flammable, n.o.s. (methane)
HAZARD CLASS:	2.1	2.1
IDENTIFICATION NUMBER:	UN 1954	UN 1954
SHIPPING LABEL:	FLAMMABLE GAS	FLAMMABLE GAS

## 15. Regulatory Information

### SARA TITLE III NOTIFICATIONS AND INFORMATION

#### SARA TITLE III - HAZARD CLASSES:

Fire Hazard

Sudden Release of Pressure Hazard

MSDS: G-458

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**SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION:**

This product does not contain toxic chemicals subject to reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

**U.S. TSCA/Canadian DSL:** All ingredients are listed on the U.S. Toxic Substances Control Act (TSCA) inventory or exempt from listing and on the Canadian Domestic Substance List (DSL).

**California Proposition 65:** This product does not contain ingredient(s) known to the State of California to cause cancer or reproductive toxicity.

**16. Other Information**

**NFPA HAZARD CODES**

Health: 1  
Flammability: 4  
Instability: 0

**HMIS HAZARD CODES**

Health: 0  
Flammability: 4  
Reactivity: 0

**RATINGS SYSTEM**

0 = No Hazard  
1 = Slight Hazard  
2 = Moderate Hazard  
3 = Serious Hazard  
4 = Severe Hazard

Note: The Reactivity Hazard Rating is based on the 2<sup>nd</sup> Edition of the National Paint and Coatings Association's (NPCA's) Hazardous Materials Identification System (HMIS®). Hazard ratings were based on the best available information at the time of the review. Ratings will be re-assigned in accordance with Compressed Gas Association (CGA) guidelines as published in the future edition of CGA Pamphlet P-19.

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
WHMIS	Workplace Hazardous Materials Information System

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:**

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