



Emergency Contact: Chemtrec (800) 424-9300
Or Norco (208) 336-1643

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Hydrogen Cyanide 0.1PPM to 200 PPM in Nitrogen

MATERIAL SAFETY DATA SHEET

Identification

Product Name: Hydrogen Cyanide in Nitrogen 0.1 PPM to 200 PPM
CAS Number: N/A
Chemical Family: Gas Mixture
Chemical Formula: HCN 0.1PPM to 100 PPM in Nitrogen
Common Names/Synonyms: None
TDG (Canada) Classification: 2.2
WHMIS Classification: A, D2B
MSDS Identification Code/Number: 2420
Prepared By: Corporate Production

Revision Date: 11/10/02
Last Review Date: 04/20/07

Composition/Information on Ingredients

Exposure Limits¹:

INGREDIENT	% VOLUME	PEL-OSHA ²	TLV-ACGIH ³	LD ₅₀ OR LC ₅₀ Route/Species
Hydrogen Cyanide FORMULA: HCN CAS #: 74-90-8 RTECS #: MW6825000	0.1 PPM to 200 PPM	10 PPM TWA, skin	4.7 PPM Ceiling, skin	LC ₅₀ : 140 PPM inhalation 1 Hr. (ISO/RTECS: CGA P-20)
Nitrogen FORMULA: N ₂ CAS #: 7727-37-9 RTECS #: QW9700000	99.98 to 99.9999	Not Available	Not Available	Simple Asphyxiant

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

² As stated in 29 CFR 1910.1000, 1994

³ As stated in the ACGIH 2007 the Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) booklet.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.
IDLH: 50 PPM (Hydrogen Cyanide)

Hazards Identification

Emergency Overview:

Colorless non-flammable gas with faint odor of bitter almonds. Contains small amounts of hydrogen cyanide, which acts on the nervous system to paralyze the respiratory system. Contact with this product may irritate the eyes and skin. Toxic if absorbed through the skin. Contents under pressure. Use and store below 125°F (52°C).

Route of Entry:

Skin Contact Yes	Skin Absorption Yes	Eye Contact Yes	Inhalation Yes	Ingestion No
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Hazards Identification Continued

Health Effects

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

Carcinogenicity: NTP: No IARC: No OSHA: No

Eye Effects:

Vapors may irritate the eyes.

Skin Effects:

Vapors or liquid may be fatal if absorbed through the skin.

Ingestion Effects:

Accidental ingestion is unlikely as at ambient temperature and pressure (NTP) this product is a gas.

Inhalation Effects:

Nitrogen acts as a simple asphyxiant displacing the oxygen content in the air necessary for life. The following effects of asphyxiation are representative and it is possible that none of these symptoms may occur: loss of balance or dizziness; tightness in the frontal area of the forehead; tingling of the tongue, fingertips, or toes; weakened speech leading to the inability to utter sounds; rapid reduction in the ability to perform movements; reduced consciousness of surroundings; loss of tactile sensations; and heightened mental activity.

Hydrogen cyanide may deaden the sense of smell, decreasing the possibility of detection prior to fatal concentrations. Symptoms of poisoning appear within seconds to minutes after breathing vapors. Massive doses may produce, without warning, sudden loss or consciousness and prompt death from respiratory arrest. With smaller but still lethal doses, the illness may be prolonged for one or more hours.

Concentration of Hydrogen Cyanide	Observed Effects
2 – 5 PPM	Detectable odor threshold.
18 – 36 PPM	Slight symptoms after several hours.
45 – 54 PPM	Tolerated for 0.5 – 1 hour without immediate or delayed effects.
110 – 135 PPM	Dangerous to life or fatal after 0.5 – 1 hour.
133 PPM	Fatal after 30 minutes.
180 PPM	Fatal after 10 minutes.
270 PPM	Immediately fatal.

NFPA Hazard Codes

Health: 3
Flammability: 0
Reactivity: 0

HMIS Hazard Codes

Health: 3
Flammability: 0
Physical Hazard: 3

Ratings System

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

Hazard ratings were assigned in accordance with Compressed Gas Association (CGA) recommendations as published in CGA Pamphlet P-19-2004, *CGA Recommended Hazard Ratings for Compressed Gases, 2nd Edition*.

First Aid Measures

Eyes:
Immediately flush eyes with large amounts of water for at least 15 minutes opening and closing eyelids to ensure adequate rinsing. If irritation persists or cyanide exposure is suspected, seek immediate medical attention.

Skin:
Remove contaminated clothing and flush affected area with lukewarm water for at least 15 minutes. If irritation persists or cyanide exposure is suspected, seek immediate medical attention.

Ingestion:
Unlikely; product is a gas. Contact local poison control center. A physician should see the patient promptly.

Inhalation:
PROMPT REMOVAL FROM THE CONTAMINATED AREA AND IMMEDIATE MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE AWARE OF THE HEALTH HAZARDS ASSOCIATED WITH HYDROGEN CYANIDE.

Remove the victim from the contaminated area as soon as possible. If victim is not breathing, ensure that an airway is open and administer artificial resuscitation and supplemental oxygen.

A complete Cyanide Antidote Kit should be available near all areas of use. Personnel should be trained in the use of the kit to administer first aid in advance of medical assistance. Pertinent medical records shall be maintained for 5 years following the last exposure to hydrogen cyanide.

Fire Fighting Measures

Conditions of Flammability: Not flammable		
Flash Point: None	Method: Not Applicable	Autoignition Temperature: None
LEL (%): None	UEL (%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

Fire and Explosion Hazards:
The majority of this product constitutes a nonflammable inert gas. Cylinders may rupture or explode from pressure when involved in a fire situation.

Extinguishing Media:
Water spray to keep cylinders cool. Extinguishing agent appropriate for the combustible material.

Fire Fighting Instructions:
Continue to cool heat or flame exposed containers until well after the flames are extinguished. Firefighters should wear a full-facepiece, NIOSH/MSHA-approved self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear.

Accidental Release Measures

Isolate hazard area, evacuate personnel and deny entry to unauthorized/unprotected individuals. Use appropriate protective equipment including respiratory protection for high or unknown concentrations. Personnel should not re-enter hazard area until hydrogen cyanide is dispersed and adequate atmospheric oxygen is re-established. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest Norco/NorLab location.

Handling and Storage

Electrical Classification:

Non-hazardous

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 reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping 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 backflow into the cylinder.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavy traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125^o F (52^o C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a "first in, first out" inventory system to prevent full cylinders being stored for excessive period of time.

For additional recommendations, consult Compressed Gas Association's Pamphlets P-1.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

Exposure Controls, Personal Protection

Engineering Controls:

Use a laboratory hood with forced ventilation for handling small quantities. Use local exhaust ventilation as necessary to maintain atmospheric oxygen levels above 19.5% and control air contaminants to below acceptable exposure guidelines.

Eye/Face Protection:

Eye/face protection is recommended in all instances of potential exposure, and may be necessary if concentrations are to exceed exposure limits. Contact lenses should not be worn when working with this product.

Skin Protection:

Protective gloves made of neoprene or rubber should be used at all times when working with hydrogen cyanide. Where contact may occur wear apron, face shield, and other skin protection as necessary to prevent contact.

Respiratory Protection:

None normally required with proper monitoring and ventilation systems in place to maintain concentration below PEL. Breathing apparatus alone is not considered complete protection in atmospheres containing over 1000 PPM of hydrogen cyanide as toxic amounts can be absorbed through the skin.

Use a NOISH/MSHA approved positive pressure air line with mask and escape bottle or SCBA for gas concentrations above occupational exposure limits, for potential of uncontrolled release, if exposure levels are not known, or in an oxygen deficient atmosphere.

Other/General Protection:

Safety shoes, emergency eyewash station.

Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Above critical temp.	
Vapor density (Air = 1)	: 0.97	
Evaporation point	: Not Available	
Boiling point	: -320	°F
	: -195.8	°C
Freezing point	: -345.9	°F
	: -209.9	°C
pH	: Not Available	
Specific gravity at STP	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H ₂ O)	: Very Slightly Soluble	
Odor threshold	: 2 – 5 PPM	(As Hydrogen Cyanide)
Odor and appearance	: Colorless gas. Odorless to bitter-sweet almond odor.	

Stability and Reactivity

Stability:

Stable

Incompatible Materials:

No data for mixture.

Hazardous Polymerization:

Will not occur.

Toxicological Information

Acute Studies:

Workers exposed for a period of seven years to hydrogen cyanide concentrations between 4 and 12 PPM showed increase in subjective symptoms such as headache, weakness, change in taste and smell, irritation of throat, vomiting, difficulty in breathing after exertion, lacrimation, abdominal colic, precordial pain and nervous instability.

Enlargement of the thyroid gland, attributed possibly to effects of thiocyanate, the chief metabolite of cyanide, was reported over a period of years to low concentrations in air.

A study was undertaken to assess the health status of workers exposed to cyanide fumes and aerosols in a factory. Cyanide levels were measured in the work environment and in blood and urine. Smokers had a higher concentration than non-smokers. The concentrations in the breathing zone and workroom atmospheres were 0.8 and 0.2 mg/m³ respectively. The workers complained of typical cyanide poisoning in spite of low concentrations.

Inhalation Effects:

Hydrogen cyanide blocks respiration at the cellular level. Acute poisoning results in weakness, headache, confusion, nausea, and vomiting.

Hydrogen Cyanide: LC_{LO} (human): 120 mg/m³/1 Hr. LC 50: 160 PPM/0 min. (rat).

Other:

Chronic exposure to hydrogen cyanide may cause fatigue and weakness.

Long term effects include neurasthenia with autonomic nervous system involvement, psychic alterations, precordial pains, breathlessness on exercise, bradycardia, arterial hypotomia, polycythemia, dyspepsia, hepatic impairment, and thyroidal hypofunction. May cause liver, kidney, cardiovascular, or central nervous system disorders.

Ecological Information

Product does not contain Class I or Class II ozone depleting substances.

Disposal Considerations

Do not attempt to dispose of waste or unused quantities in refillable cylinders. Return in the shipping container *properly labeled with any valve outlet plugs or caps secure and valve protection cap in place* to Norco for proper disposal. Non refillable cylinders may be safely vented outdoors and disposed of in accordance with State and/or local regulations or return to NorLab for disposal.

Transport Information

PARAMETER	United States DOT	Canada TDG
Proper Shipping Name:	Compressed Gas, N.O.S., (Hydrogen Cyanide, Nitrogen)	Compressed Gas, N.O.S.,
Hazard Class:	2.2	2.2
Identification Number	1956	1956
Shipping label:	Non-flammable gas	Non-flammable gas

Regulatory Information

Hydrogen cyanide is listed under the accident prevention provisions of section 112R of the Clean Air Act (CAA) with a threshold quantity (TQ) of 2,500 pounds.

RCRA Information:

Hydrogen Cyanide is listed as a RCRA hazardous waste P063 (40 CFR 261.33) and D003 (40 CFR 261.23).

SARA Title III Notification and Information:

The presence of hydrogen cyanide in quantities in excess of the threshold planning quantity (TQP) of 100 pounds requires certain emergency planning activities to be conducted.

Releases of hydrogen cyanide in quantities equal to or greater than the reportable quantity (RQ) of 10 pounds are subject to reporting to the National Response Center under CERCLA, Section 304 SARA Title III.

SARA Title III – Hazard Classes:

Acute Health Hazard
Chronic Health Hazard
Sudden Release of Pressure Hazard

SARA Title III – Section 313 Supplier Notification:

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

Hydrogen Cyanide: CAS Number 74-90-8 in concentrations of 0.1 PPM to 200 PPM.

This information must be included on all MSDSs that are copied and distributed for this material.

California Proposition 65:

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

Other Information

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:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).