



MATERIAL SAFETY DATA SHEET - CALIBRATION CHECK GAS

PRODUCT NAME: PHOSPHINE (5 PPM TO 0.1%) IN NITROGEN

MSDS NO: PH3

Version:3

Date: January, 2009

1. Chemical Product and Company Identification

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PRODUCT NAME: PHOSPHINE (5 PPM TO 0.1%) IN NITROGEN

CHEMICAL NAME: Phosphine in Nitrogen

COMMON NAMES/ SYNONYMS: None

TDG (Canada) CLASSIFICATION: 2.2

WHIMIS CLASSIFICATION: A

2. COMPOSITION/ INFORMATION ON INGREDIENTS

INGREDIENT	%VOLUME	PEL-OSHA	TLV-ACGIH	LD ₅₀ or LC ₅₀ Route/Species
Phosphine FORMULA: PH ₃	<5 PPM to 0.1%	0.3 ppm	0.3 ppm 1 ppm STEL	Not Available
Nitrogen FORMULA: N ₂	≤99.0 to 99.9999	Simple Asphyxiant	Simple Asphyxiant	Not Available

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Non-flammable gas with slight unpleasant odor which contains Phosphine which can cause severe pulmonary irritation, edema, and death. Nitrogen acts as a simple asphyxiant. Can cause eye and skin irritation. Long-term exposure to non-lethal concentrations of phosphine can produce toxic syndrome. Do not use in confined areas. Do not inhale. Avoid direct contact.

ROUTE OF ENTRY:

Skin Contact Yes	Skin Absorption No	Eye Contact Yes	Inhalation Yes	Ingestion No
HEALTH EFFECTS: Exposure Limits Yes	Irritant Yes	Sensitization No	Reproductive Hazard No	Mutagen No

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

EYE EFFECTS:

Direct contact may cause irritation.

SKIN EFFECTS:

Phosphine may combine with moisture on the skin to form small amounts of phosphoric acid which may cause pain, burning and irritation.



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INGESTION EFFECTS:

Ingestion unlikely. Gas at room temperature.

INHALATION EFFECTS:

Phosphine is a highly toxic gas with serious effects produced by exposure to 5-10 ppm for several hours. Inhalation of Phosphine has resulted in headaches, dizziness, tremors, general fatigue, gastrointestinal pain in the region of the diaphragm, thirst, back pains, nausea, vomiting, diarrhea, chest pressure, chills stupor, fainting, productive cough with fluorescent green sputum, pulmonary edema, convulsions, coma and death. Pulmonary edema may be delayed following and symptomatic period. All persons exposed to Phosphine gas should be observed for 72 hours.

Nitrogen acts as a simple asphyxiant displacing the oxygen content in the air necessary for life.

NFPA HAZARD CODES

Health: 2
Flammability: 0
Reactivity: 0

HMIS HAZARD CODES

Health: 2
Flammability: 0
Reactivity:

RATING SYSTEM

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

4. FIRST AID MEASURES

EYES:

Flush contaminated eyes with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes. Seek immediate medical attention.

SKIN:

Remove contaminated clothing as rapidly as possible. Flush affected area with copious quantities of water. Seek immediate medical attention.

INGESTION:

Not required

INHALATION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH THE 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.

5. FIRE-FIGHTING MEASURES

These containers hold gas under pressure, with no liquid phase. If involved in a major fire, they should be sprayed with water to avoid pressure increases, otherwise pressures will rise and ultimately they may distort or burst to release the contents. The gases will not add significantly to the fire, but containers or fragments may be projected considerable distances - thereby hampering fire-fighting efforts.

6. ACCIDENTAL RELEASE MEASURES

In terms of weight, these containers hold very little contents, such that any accidental release by puncturing etc. will be of no practical concern.



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7. HANDLING AND STORAGE

Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Use only in well-ventilated areas. Do not heat cylinder by any means to increase rate of product from the cylinder. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Use adequate ventilation for extended use of gas.

9. PHYSICAL AND CHEMICAL PROPERTIES

PARAMETER:	VALUE:
Physical state	: Gas
Evaporation point	: N/A
pH	: N/A
Odor and appearance	: Colorless gas with slight unpleasant odor of decaying fish

10. STABILITY AND REACTIVITY

Stable under normal conditions. Expected shelf life 12 months.

11. TOXICOLOGICAL INFORMATION

Skeletal injury may occur as a manifestation of chronic phosphorus poisoning. The most important sign of chronic phosphorus poisoning is osteomyelitis of the jaw bones which commonly begins as a dental disturbance.

Although the main toxic effects of Phosphine are severe pulmonary irritation and pulmonary edema, exposure has resulted in circulatory, cardiac and cerebral difficulties followed later by hepatic and renal toxicity.

Symptoms of asphyxiation may include: 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.

12. ECOLOGICAL INFORMATION

No ecological damage caused by this product.

13. DISPOSAL INFORMATION

Do not discharge into any place where its accumulation could be dangerous. Used containers are acceptable for disposal in the normal waste stream as long as the cylinder is empty and valve removed or cylinder wall is punctured; but GASCO encourages the consumer to return cylinders.



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14. TRANSPORT INFORMATION

	<u>United States DOT</u>	<u>Canada TDG</u>
PROPER SHIPPING NAME:	Compressed Gas N.O.S. (Phosphine in Nitrogen)	Compressed Gas N.O.S. (Phosphine in Nitrogen)
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN1956	UN1956
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. REGULATORY INFORMATION

Classified non-flammable/non-toxic according to Directives 88/379/EEC, 67/548/EEC and the UK's CHIP 96 Regulations.

16. OTHER INFORMATION

This MSDS has been prepared in accordance with the Chemicals (Hazard Information and Packaging for Supply (Amendment) Regulation 1996. The information is based on the best knowledge of GASCO, and its advisors and is given in good faith, but we cannot guarantee its accuracy, reliability or completeness and therefore disclaim any liability for loss or damage arising out of use of this data. Since conditions of use are outside the control of the Company and its advisors we disclaim any liability for loss or damage when the product is used for other purposes than it is intended.