



## SAFETY DATA SHEETS

M-22913/E-2

DATE: 21May2015

SUPPLIER ADDRESS: 1290 COMBERMERE STREET

TROY, MI 48083

EMERGENCY PHONE NUMBER: (248) 589-2950

### 1. CHEMICAL PRODUCT

PRODUCT NAME: NITRIC OXIDE IN NITROGEN

SYNONYMS: None

### 2. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredient Name	Formula	CAS#	Concentration	Exposure Limits (PPM)			
				ACGIH TLV	OSHA PEL	MAC	Other STEL
NITRIC OXIDE	NO	10102-43-9	.0026-2.3 PCT	25	25	25	NE
NITROGEN		7727-37-9	BALANCE	S/A	S/A	S/A	S/A

Note: NE = NONE ESTABLISHED  
S/A = SIMPLE ASPHYXIANT

### 3. HAZARD IDENTIFICATION

\*\*\* EMERGENCY OVERVIEW \*\*\*

High pressure gas.  
Can cause rapid suffocation.  
Can cause lung damage.  
Can cause eye and skin burns.  
Symptoms may be delayed.

#### POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY: Inhalation , Skin

ACUTE EFFECTS: Mixture can act as a simple asphyxiant by displacing air necessary for life. Nitric oxide forms acids in the lungs which are irritants that cause congestion of the throat and bronchi and edema of the lungs. Symptoms include headache, lowering of blood pressure, dizziness, development of cyanosis and loss of consciousness. Because of its minor irritating affects on the upper respiratory tract, the warning properties are limited.

CHRONIC EFFECTS: Nitric oxide may cause permanent decrements in pulmonary function.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None known

OTHER EFFECTS OF OVEREXPOSURE: None

CARCINOGENICITY (US Only):

NTP - No

IARC MONOGRAPHS - No

OSHA REGULATED - No

### 4. FIRST AID MEASURES

**INHALATION:** Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Lay victim with head and chest lower than hips to improve drainage of fluids from the lungs.

**EYE CONTACT:** Immediately flush with copious amounts of water for at least 15 minutes.

**SKIN CONTACT:** Immediately flush with copious amounts of water for at least 15 minutes while removing contaminated clothing.

**INGESTION:** None

**IN EVENT OF EXPOSURE, CONSULT A PHYSICIAN**

**NOTE TO PHYSICIAN:** Signs and symptoms of pulmonary edema can be delayed for several hours.

### 5. FIRE FIGHTING MEASURES

**FLASH POINT:** Nonflammable

**AUTOIGNITION TEMPERATURE:** N/Ap

**FLAMMABLE LIMITS:** Nonflammable

**LOWER:**

**UPPER:**

**EXTINGUISHING MEDIA:** Use what is appropriate for surrounding fire.

**SPECIAL FIRE FIGHTING INSTRUCTION AND EQUIPMENT:** Wear self-contained breathing apparatus and full protective clothing. Keep fire exposed cylinders cool with water spray. If possible, stop the product flow.

**HAZARDOUS COMBUSTION PRODUCTS:** Nitric oxide in contact with air forms highly toxic fumes of NOx.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Cylinder rupture may occur under fire

conditions.

## 6. ACCIDENTAL RELEASE MEASURES

**CLEAN UP PROCEDURES:** Evacuate and ventilate area. Remove leaking cylinder to exhaust hood or safe outdoor area. Shut off source if possible and remove source of heat. To dispose of gas into an adequate amount of alkaline potassium permanganate solution.

**SPECIALIZED EQUIPMENT:** Leaks of nitric oxide are detectable by the formation of reddish-brown NO<sub>2</sub>.

## 7. HANDLING AND STORAGE

**PRECAUTIONS TO BE TAKEN IN HANDLING:** Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

**PRECAUTIONS TO BE TAKEN IN STORAGE:**  
Store in well ventilated areas away from combustibles. Keep valve protection cap on cylinders when not in use.

## 8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

**ENGINEERING CONTROLS:** Provide adequate general and local exhaust ventilation to maintain concentration below exposure limits.

### PERSONAL PROTECTION

**EYE/FACE PROTECTION:** Safety glasses

**SKIN PROTECTION:** None

**RESPIRATORY PROTECTION:** In case of leakage, use self-contained breathing apparatus.

**OTHER PROTECTIVE EQUIPMENT:** Safety shoes when handling cylinders.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE:** Colorless

**ODOR:** Sweet odor. (NO)

**PHYSICAL STATE:** Gas

**VAPOR PRESSURE:** N/Ap

**VAPOR DENSITY (AIR=1):** 0.968

**BOILING POINT (C):** N/Ap

**SOLUBILITY IN WATER:** cm<sup>3</sup>/100c<sup>3</sup> H<sub>2</sub>O 1.485

**SPECIFIC GRAVITY (H<sub>2</sub>O=1):** Gas

**EVAPORATION RATE:** Gas

**ODOR THRESHOLD:** 0.27-0.9ppm

## 10. STABILITY AND REACTIVITY

**STABILITY:** Stable under normal storage conditions.

**CONDITIONS TO AVOID:** Storage in poorly ventilated areas. Storage near a heat source.

**MATERIALS TO AVOID:** Reacts with organic and reducing materials. Nitrogen reacts with Li, Nd, and Ti at high temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**HAZARDOUS DECOMPOSITION:** In contact with air nitric oxide forms toxic fumes of NO<sub>x</sub>.

## 11. TOXICOLOGICAL INFORMATION

**LETHAL CONCENTRATION (LC50):** 115 ppm (NO) rat one hour.

**LETHAL DOSE 50 (LD50):** N/Ap

**TERATOGENICITY:** N/Ap

**REPRODUCTIVE EFFECTS:** N/Ap

**MUTAGENICITY:** N/Ap

## 12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected.

## 13. DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** Return cylinders to supplier with any valve outlet plugs or caps secured and valve protection cap in place. Dispose of non-refillable cylinders in accordance with federal, state, and local regulations.

## 14. TRANSPORT INFORMATION

**CONCENTRATION:** .0026-2.3%

**DOT DESCRIPTION (US ONLY):**

**PROPER SHIPPING NAME:** Compressed gas,

n.o.s.

**HAZARD CLASS:** 2.2 (nonflammable)

**IDENTIFICATION NUMBER:** UN1956

REPORTABLE QUANTITIES: (NO) 10 lbs  
LABELING: NONFLAMMABLE GAS  
ADR/RID (EU Only): Class 2, 1A  
SPECIAL PRECAUTIONS: Cylinders should be transported in a secure upright position in a well ventilated truck.

#### 15. REGULATORY INFORMATION

OSHA: Process Safety Management: Minor component is listed in appendix A 29 CFR 1910.119 as a highly hazardous chemical.  
TSCA: Mixture is not listed in TSCA inventory.  
SARA: The threshold planning quantity for this mixture is 10,000 lbs.  
EU NUMBER: N/Ap  
NUMBER IN ANNEX 1 OF DIR 67/548: Mixture is listed in annex 1.  
EU CLASSIFICATION: N/Av  
R: 20, 36/37/38  
S: 1, 9, 17

#### 16. OTHER INFORMATION

OTHER PRECAUTIONS: Protect containers from physical damage. Do not deface cylinders or labels. Cylinders should be refilled by qualified producers of compressed gas. Shipment of a compressed gas cylinder which has not been filled by the owner or with his written consent is a violation of federal law (49 CFR).

ABBREVIATIONS:  
N/Ap - Not Applicable  
N/Av - Not Available  
SA - Simple Asphyxiant  
NE - None Established

DISCLAIMER: Information included in this document is given to the best of our knowledge, however, no warranty is made that the information is accurate or complete. We do not accept any responsibility for damages by the use of the document.