

# NITRIC OXIDE

NTX

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b> Mononitrogen monoxide Nitrogen monoxide	Compressed gas    Colorless    Sharp unpleasant odor
Reacts with water. Poisonous red-brown vapor cloud is produced.	
<p>Evacuate.  <b>KEEP PEOPLE AWAY. AVOID CONTACT WITH GAS.</b>  Wear goggles and self-contained breathing apparatus.  Notify local health and pollution control agencies.  Protect water intakes.</p>	
<b>Fire</b>	Not flammable.
<b>Exposure</b>	CALL FOR MEDICAL AID.  VAPOR POISONOUS IF INHALED. Irritating to eyes, nose and throat. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.
<b>Water Pollution</b>	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

### 1. CORRECTIVE RESPONSE ACTIONS

Stop discharge  
Chemical and Physical Treatment:  
Neutralize

### 2. CHEMICAL DESIGNATIONS

- 2.1 **CG Compatibility Group:** Not listed.
- 2.2 **Formula:** NO
- 2.3 **IMO/UN Designation:** 2/1660
- 2.4 **DOT ID No.:** 1660
- 2.5 **CAS Registry No.:** 10102-43-9
- 2.6 **NAERG Guide No.:** 124
- 2.7 **Standard Industrial Trade Classification:** 52239

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Self-contained breathing apparatus or gas mask with universal canister
- 3.2 **Symptoms Following Exposure:** Continued inhalation of low concentrations causes chronic irritation, cough, headache, corrosion of teeth, loss of strength; symptoms from overexposure to higher concentrations (which may be delayed for 6-24 hours) include irritation of nose and throat, tightness in chest, difficult breathing, pallor, loss of consciousness, and death; pulmonary edema occurs; if patient recovers, pneumonia may develop.
- 3.3 **Treatment of Exposure:** Get medical attention at once following inhalation of this gas. **INHALATION:** if breathing has stopped, give artificial respiration with 100% oxygen; keep victim quiet and warm; keep head and chest lower than hips, to aid in drainage from lungs; alert physician to possibility of delayed pulmonary edema during 6-24 hours.
- 3.4 **TLV-TWA:** 25 ppm
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** Not listed.
- 3.7 **Toxicity by Ingestion:** Not pertinent (gas at normal temperatures)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Currently not available
- 3.11 **Liquid or Solid Characteristics:** Currently not available
- 3.12 **Odor Threshold:** Currently not available
- 3.13 **IDLH Value:** 100 ppm
- 3.14 **OSHA PEL-TWA:** 25 ppm.
- 3.15 **OSHA PEL-STEL:** Not listed.
- 3.16 **OSHA PEL-Ceiling:** Not listed.
- 3.17 **EPA AEGL:** Not listed

### 4. FIRE HAZARDS

- 4.1 **Flash Point:**  
Not pertinent (nonflammable compressed gas)
- 4.2 **Flammable Limits in Air:** Not pertinent
- 4.3 **Fire Extinguishing Agents:** Not pertinent
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
- 4.5 **Special Hazards of Combustion Products:** Not pertinent
- 4.6 **Behavior in Fire:** Supports combustion, so all fires burn more vigorously.
- 4.7 **Auto Ignition Temperature:** Not pertinent
- 4.8 **Electrical Hazards:** Not pertinent
- 4.9 **Burning Rate:** Not pertinent
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent.
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent.
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

### 5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Reacts with water to form nitric acid. The reaction is not violent.
- 5.2 **Reactivity with Common Materials:**  
Reacts rapidly with air to form nitrogen tetroxide; see this compound.
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Flood with water, rinse with sodium bicarbonate or lime solution.
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

### 6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**  
Currently not available
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** Not pertinent
- 6.4 **Food Chain Concentration Potential:**  
None
- 6.5 **GESAMP Hazard Profile:** Not listed

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** C.P.: 99+%
- 7.2 **Storage Temperature:** Cool ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Safety relief. Containers must be in well-ventilated area.
- 7.5 **IMO Pollution Category:** Currently not available
- 7.6 **Ship Type:** Currently not available
- 7.7 **Barge Hull Type:** Currently not available

### 8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Poison gas
- 8.2 **49 CFR Class:** 2.3
- 8.3 **49 CFR Package Group:** Not pertinent.
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:** Not listed
- 8.6 **EPA Reportable Quantity:** 10 pounds
- 8.7 **EPA Pollution Category:** A
- 8.8 **RCRA Waste Number:** P076
- 8.9 **EPA FWPCA List:** Not listed

### 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Gas
- 9.2 **Molecular Weight:** 30.0
- 9.3 **Boiling Point at 1 atm:** -241.1°F = -151.7°C = 121.5°K
- 9.4 **Freezing Point:** -262.5°F = -163.6°C = 109.6°K
- 9.5 **Critical Temperature:** 847.4°F = 453°C = 726.2°K
- 9.6 **Critical Pressure:** 940 psia = 64 atm = 6.5 MN/m<sup>2</sup>
- 9.7 **Specific Gravity:** Not pertinent
- 9.8 **Liquid Surface Tension:** Not pertinent
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** 1.6 (nitrogen dioxide)
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.400 at 15°C
- 9.12 **Latent Heat of Vaporization:** Not pertinent
- 9.13 **Heat of Combustion:** Not pertinent
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** -257 Btu/lb = -143 cal/g = 5.98 X 10<sup>2</sup> J/kg
- 9.16 **Heat of Polymerization:** Not pertinent
- 9.17 **Heat of Fusion:** 18.3 cal/g
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** Currently not available

### NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
	N O T  P E R T I N E N T		N O T  P E R T I N E N T		N O T  P E R T I N E N T		N O T  P E R T I N E N T

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	R E A C T S		N O T  P E R T I N E N T		N O T  P E R T I N E N T	0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250	0.233 0.233