

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NEW JERSEY 07054-0624

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300
INFORMATION CONTACT:
973-257-1100

SUBSTANCE: NITRIC OXIDE

TRADE NAMES/SYNONYMS:

MTG MSDS 66; NITROGEN OXIDE (NO); NITRIC OXIDE (NO); NITRIC OXIDE TRIMER; NITROGEN MONOXIDE; NITROGEN MONOOXIDE; NITROGEN OXIDE (N4O4); NITROSYL RADICAL; RCRA P076; STCC 4920330; UN 1660; NO; MAT16560; RTECS QX0525000

CHEMICAL FAMILY: inorganic, gas

CREATION DATE: Jan 24 1989

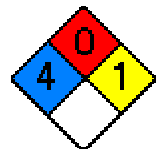
REVISION DATE: Sep 18 2003

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: NITRIC OXIDE
CAS NUMBER: 10102-43-9
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=0 REACTIVITY=1



EMERGENCY OVERVIEW:

COLOR: colorless

PHYSICAL FORM: gas

MAJOR HEALTH HAZARDS: harmful if inhaled, respiratory tract irritation, skin irritation, blood damage

PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat. May ignite combustibles. May react on contact with water. May react on contact with air. Releases toxic, corrosive, flammable or explosive gases.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting, stomach pain, chest pain, difficulty breathing, headache, dizziness, bluish skin color, lung congestion

LONG TERM EXPOSURE: same as effects reported in short term exposure

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation (possibly severe)

LONG TERM EXPOSURE: no information is available

EYE CONTACT:

SHORT TERM EXPOSURE: irritation (possibly severe)

LONG TERM EXPOSURE: no information is available

INGESTION:

SHORT TERM EXPOSURE: no information is available

LONG TERM EXPOSURE: no information is available

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

ANTIDOTE: methylene blue, intravenous; ascorbic acid, intravenous.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.

EXTINGUISHING MEDIA: water

Do not use dry chemicals, carbon dioxide or halogenated extinguishing agents. Large fires: Flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. For small fires, contain and let burn.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Stop leak if possible without personal risk. Avoid contact with combustible materials. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. NFPA 430 Code for the Storage of Liquid and Solid Oxidizing Materials. Keep separated from incompatible substances. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30).

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

NITRIC OXIDE:

25 ppm (30 mg/m³) OSHA TWA

25 ppm ACGIH TWA

25 ppm (30 mg/m³) NIOSH recommended TWA 10 hour(s)

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

100 ppm

Any supplied-air respirator operated in a continuous-flow mode.

Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against this substance.

Only non-oxidizable sorbents are allowed (not charcoal).

Any powered, air-purifying respirator with cartridge(s) providing protection against this substance.

Only non-oxidizable sorbents are allowed (not charcoal).

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Only non-oxidizable sorbents are allowed (not charcoal).

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Only non-oxidizable sorbents are allowed (not charcoal).

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas

COLOR: colorless

ODOR: Not available

MOLECULAR WEIGHT: 30.01

MOLECULAR FORMULA: N-O

BOILING POINT: -242 F (-152 C)

FREEZING POINT: -263 F (-164 C)

VAPOR PRESSURE: 26000 mmHg @ 20 C

VAPOR DENSITY (air=1): 1.036

SPECIFIC GRAVITY: Not applicable

DENSITY: 1.3402 g/L

WATER SOLUBILITY: 7.3% @ 0 C

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: 0.3-1.0 ppm

EVAPORATION RATE: Not applicable

VISCOSITY: 0.0188 cP @ 25 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

SOLVENT SOLUBILITY:

Soluble: sulfuric acid, alcohol, ferrous sulfate solutions, carbon disulfide

10. STABILITY AND REACTIVITY

REACTIVITY: May react on contact with air. May react on contact with water. Releases toxic, corrosive, flammable or explosive gases. May explode during distillation or evaporation.

CONDITIONS TO AVOID: Avoid contact with combustible materials. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

INCOMPATIBILITIES: metals, bases, metal oxides, reducing agents, combustible materials, halo carbons, oxidizing materials, halogens, metal carbide, metal salts

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of nitrogen

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

NITRIC OXIDE:

TOXICITY DATA:

160 mg/m³ inhalation-rat LC50

LOCAL EFFECTS:

Irritant: inhalation, skin

ACUTE TOXICITY LEVEL:

Highly Toxic: inhalation

TARGET ORGANS: blood

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders

MUTAGENIC DATA: Available.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D003. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Nitric oxide, compressed

ID NUMBER: UN1660

HAZARD CLASS OR DIVISION: 2.3

LABELING REQUIREMENTS: 2.3; 5.1; 8

QUANTITY LIMITATIONS:

PASSENGER AIRCRAFT OR RAILCAR: Forbidden

CARGO AIRCRAFT ONLY: Forbidden

ADDITIONAL SHIPPING DESCRIPTION: Toxic-Inhalation Hazard Zone A



CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Nitric oxide, compressed

UN NUMBER: UN1660

CLASS: 2.3; 5.1; 8

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

NITRIC OXIDE: 10 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):

NITRIC OXIDE: 100 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):

NITRIC OXIDE: 10 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes

CHRONIC: No

FIRE: No

REACTIVE: No

SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119):

NITRIC OXIDE: 250 LBS TQ

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: ACD1

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.



16. OTHER INFORMATION

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