Safety Data Sheet

Nitrogen Dioxide

PurityPlus Gases
6331 East 20th Street
P.O. Box 19907
Indianapolis, IN 46219-0907
317.562.1483 (tel)
317.562.1484 (fax)

Section 1: Product and Company Identification

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Product Code: Nitrogen Dioxide

Section 2: Hazards Identification

Danger

Hazard Classification:

Acute Gas Inhale Toxicity (Category 1)
Corrosive To Metal (Category 1)
Gases Under Pressure
Oxidizing Gas (Category 1)
Skin Corrosion (Category 1.B)

Hazard Statements:

Causes severe skin burns and eye damage
Contains gas under pressure; may explode if heated
Fatal if inhaled
May be corrosive to metals
May cause or intensify fire; oxidizer

Precautionary Statements

Prevention:

Do not breathe dust/fume/gas/mist/ vapors/spray..
[In case of inadequate ventilation] wear respiratory protection.
Keep and store away from clothing and combustible materials.
Wash thoroughly after handling.
Keep reduction valves/valves and fittings free from oil and grease.
Use only outdoors or in a well-ventilated area.
Wear protective gloves, protective clothing, eye protection and face protection.
Keep only in original container.

Response:

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Immediately call a poison center or doctor.
In case of fire: Stop leak if safe to do so.
Absorb spillage to prevent material damage.
Specific treatment is urgent.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If inhaled: Remove person to fresh air and keep comfortable for breathing.

Storage:
Store in a well-ventilated place. Keep container tightly closed.
Protect from sunlight.
Store locked up.
Store in corrosive resistant container with a resistant inner liner.

Disposal:
Dispose of contents and/or container in accordance with applicable regulations.

Section 3: Composition/Information on Ingredients

CAS #
10102-44-0

Chemical Substance	Chemical Family	Trade Names
NITROGEN DIOXIDE	Inorganic gases	Dinitrogen tetroxide Dinitrogen tetroxide, liquefied Nitrogen dioxide, liquefied Nitrogen oxide Nitrogen peroxide Nitrogen peroxide, liquefied Nitrogen tetroxide

Section 4: First Aid Measures

Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
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.	Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	Not applicable route of exposure	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	None

Section 5: Fire Fighting Measures

Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
Non-flammable gas. Use suitable extinguishing media for surrounding fire.	Thermal decomposition to give nitric oxide and oxygen when heated above 160 deg C	▪ Any self-contained breathing apparatus with a full facepiece. Use a chemical protective suit. ▪ Any self-contained breathing apparatus with a full facepiece. Use a chemical protective suit.

Section 6: Accidental Release Measures

Personal Precautions	Environmental Precautions	Methods for Containment
Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.	Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers.	Not available.

Methods for Cleanup	Other Information
Contact emergency personnel	None.

Section 7: Handling and Storage

Handling	Storage
Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125F (52C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.	Do not get liquid in eyes, on skin, or clothing. Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Open valve slowly. Close cylinder valve after each use; keep closed even when empty. If valve is hard to open, discontinue use and contact your supplier.

Section 8: Exposure Controls/Personal Protection

Exposure Guidelines
TLV-TWA: 3 ppm Short-term Exposure Limits (TLV-STEL): 5ppm

Engineering Controls

Handle only in fully enclosed systems.

Eye Protection	Skin Protection	Respiratory Protection
Eye protection not required, but recommended.	Wear appropriate chemical resistant clothing.	Any self-contained breathing apparatus with a full facepiece. Use a chemical protective suit.

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor	Taste
Gas	Clear	Yellow to dark brown	N/A	Gas	Pungent odor	N/A

Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
Not applicable	Not available	Not available	Nonflammable	Nonflammable	Nonflammable

Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
70.1F	12 F (-11 C)	760 mmHg @ 21.1 C	1.58 (air=1)	1.449	Reacts to form nitric acid and nitrous acid; nitrous acid then decomposes to nitric acid and nitric oxide.	Not applicable; solutions are very acidic	Reported values vary. 0.11-0.14 ppm (minimum perceptible value)	Not applicable	0.42 cP @ 20 C

Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
46.01 (NO2) or 92.01 (N2O4)	N-O2 or N2-O4	Not available	Not available	100%	Not available	Soluble: Alkalies, chloroform, carbon disulfide and concentrated nitric and sulfuric acids.

Section 10: Stability and Reactivity

Stability	Conditions to Avoid	Incompatible Materials
Normally stable. Nitrogen dioxide thermally decomposes to nitric oxide and oxygen when heated above 160 deg C.	Normally stable. Nitrogen dioxide thermally decomposes to nitric oxide and oxygen when heated above 160 deg C.	ACETIC ANHYDRIDE, ALCOHOLS, AMMONIA, BORON TRICHLORIDE, CALCIUM, DIMETHYL SULFOXIDE, FORMALDEHYDE , hydrogen, oxygen, metals

Hazardous Decomposition Products	Possibility of Hazardous Reactions
Decomposes in water to form nitric acid and nitrous acid.	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

Oral LD50	Dermal LD50	Inhalation
LC50 Inhalation Vapor Rat 790 mg/m3 5 minutes	Not available	Respiratory tract irritation, cough, dyspnea, headache, nausea, irregular heartbeat, fatigue, pulmonary edema, rapid breathing, increased heart rate, dyspnea, chest pain, bleeding from the lungs or small airways and cyanosis (bluish discoloration of the skin)

Eye Irritation	Skin Irritation	Sensitization
Irritation	Liquid: burns	Respiratory tract irritation, difficulty breathing, skin irritation, eye irritation

Chronic Effects

Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
May be a carcinogen	Mutagenic	May have reproductive effects.	No data

Section 12: Ecological Information

Fate and Transport

Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Fish toxicity: Acute LC50 19600 ug/L Fresh water Fish - Tench - Tinca tinca - LARVAE - 20 days - 11.18 mm - 11.36 mg 96 hours Invertibrate toxicity: Acute LC50 79450 ug/L Marine water Crustaceans - Redtail prawn - Penaeus penicillatus - 3.58 to 4.75 cm - 0.4 to 0.69 g 48 hours Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

Dispose in accordance with all applicable federal and local regulations.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
DINITROGEN TETROXIDE; or NITROGEN DIOXIDE	UN1067	2.3, 5.1	Not applicable	DINITROGEN TETROXIDE	Forbidden	Forbidden	N/A

Canadian Transportation of Dangerous Goods

Shipping Name	UN Number	Class	Packing Group / Risk Group
DINITROGEN TETROXIDE; or NITROGEN DIOXIDE	UN1067	2.3	Not applicable

Section 15: Regulatory Information

U.S. Regulations

CERCLA Sections	SARA 355.30	SARA 355.40
Not regulated.	100 LBS TPQ	10 LBS RQ

SARA 370.21

Acute	Chronic	Fire	Reactive	Sudden Release
Yes	No	Yes	No	Yes

SARA 372.65

N/A

OSHA Process Safety

Not available

State Regulations

CA Proposition 65
Not regulated

Canadian Regulations

WHMIS Classification
A, C, D1A, D2B, E

National Inventory Status

US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDSL)
Listed on inventory.	Listed	Listed on inventory.

Section 16: Other Information

NFPA Rating
Not available

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard