

Section 1: Product and Company Identification

Minneapolis Oxygen Company
3842 Washington Avenue North
Minneapolis, MN 55412
612-588-8855

PERS 1-800-633-8253
CONTRACT #529

Product Code: ≤1% Nitrogen Dioxide balance Air

Synonyms:
Recommended Use:
Usage Restrictions:

Section 2: Hazards Identification



Warning

Hazard Classification:

Gases Under Pressure

Hazard Statements:

Contains gas under pressure; may explode if heated

Precautionary Statements

Storage:

Protect from sunlight.
Store in well-ventilated place.

Section 3: Composition/Information on Ingredients

	CAS #	Concentration
Nitrogen Dioxide	10102-44-0	1%

Air	Not applicable	BALANCE
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	Chemical Substance	Chemical Family	Trade Names
Nitrogen Dioxide	NITROGEN DIOXIDE	Inorganic gases	Dinitrogen tetroxide Dinitrogen tetroxide, liquefied Nitrogen dioxide, liquefied Nitrogen oxide Nitrogen peroxide Nitrogen peroxide, liquefied Nitrogen tetroxide
Air	AIR, COMPRESSED	Inorganic gases	AIR; UN 1002 Nitrogen CAS: 7727-37-9 Oxygen CAS: 7782-44-7

Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
Nitrogen Dioxide	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
Air	Wash exposed skin with soap and water.	Flush eyes with plenty of water.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Get medical attention.	

Section 5: Fire Fighting Measures

	Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
Nitrogen Dioxide	Non-flammable gas. Use suitable extinguishing media for surrounding fire.	Thermal decomposition to give nitric oxide and oxygen when heated above 160 deg C	<ul style="list-style-type: none"> ▪ 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.
Air	Use extinguishing agents appropriate for surrounding fire.		<ul style="list-style-type: none"> ▪ No respirator is required under normal conditions of use.

Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment
Nitrogen Dioxide	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.
Air			Stop leak if possible without personal risk.

	Methods for Cleanup	Other Information
Nitrogen Dioxide	Contact emergency personnel	None.
Air		

Section 7: Handling and Storage

	Handling	Storage
Nitrogen Dioxide	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.
Air	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	

Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
Nitrogen Dioxide	TLV-TWA: 3 ppm Short-term Exposure Limits (TLV-STEL): 5ppm
Air	AIR, COMPRESSED: No occupational exposure limits established.

Engineering Controls

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
Nitrogen Dioxide	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.
Air	Eye protection not required under normal conditions.	Protective clothing is not required under normal conditions.	No respirator is required under normal conditions of use.

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
Nitrogen Dioxide	Gas	Clear	Yellow to dark brown	N/A	Gas	Pungent odor	N/A
Air	Gas	Clear	Colorless		Gas	Not available	

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

	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
Nitrogen Dioxide	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
Air	-317 F (-194 C)	Not available	760 mmHg @ -194 C	1	Not applicable	Slightly soluble	Not applicable	Not available	Not applicable	0.01853 cP @ 26.85 C

	Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
Nitrogen Dioxide	46.01 (NO ₂) or 92.01 (N ₂ O ₄)	N-O ₂ or N ₂ -O ₄	Not available	Not available	100%	Not available	Soluble: Alkalies, chloroform, carbon disulfide and concentrated nitric and sulfuric acids.
Air			1.29 g/L @ 0 C			Not applicable	Slightly Soluble

Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible Materials
Nitrogen Dioxide	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
Air	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	None known

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
Nitrogen Dioxide	Decomposes in water to form nitric acid and nitrous acid.	Will not polymerize.
Air	No hazard expected.	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

	Oral LD50	Dermal LD50	Inhalation
Nitrogen Dioxide	LC50 Inhalation Vapor Rat 790 mg/m ³ 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)
Air	Not available	Not available	

	Eye Irritation	Skin Irritation	Sensitization
Nitrogen Dioxide	Irritation	Liquid: burns	Respiratory tract irritation, difficulty breathing, skin irritation, eye irritation
Air	No information is available	No information is available	No significant target effects reported.

Chronic Effects

	Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
Nitrogen Dioxide	May be a carcinogen	Mutagenic	May have reproductive effects.	No data
Air	Not available	Not available	No data	No data

Section 12: Ecological Information

Fate and Transport

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Nitrogen Dioxide	Fish toxicity: Acute LC50 19600 ug/L Fresh water Fish - Tench - Tinca tinca - LARVAE - 20 days - 11.18 mm - 11.36 mg 96 hours Invertebrate 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
Air	Fish toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

Nitrogen Dioxide	Dispose in accordance with all applicable federal and local regulations.
Air	Dispose in accordance with all applicable regulations.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

DOT Information For This Mixture

Shipping Name	Compressed gas, n.o.s. (Air, Nitrogen Dioxide)
UN Number	UN1956
Hazard Class	2.2
Hazard Information	Non-Flammable Gas

Individual Component Information

	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
Nitrogen Dioxide	DINITROGEN TETROXIDE; or NITROGEN DIOXIDE	UN1067	2.3, 5.1	Not applicable	DINITROGEN TETROXIDE	Forbidden	Forbidden	N/A
Air	Air, compressed	UN1002	2.2	Not available	2.2	Not available	Not available	Not available

Canadian Transportation of Dangerous Goods

	Shipping Name	UN Number	Class	Packing Group / Risk Group
Nitrogen Dioxide	DINITROGEN TETROXIDE; or NITROGEN DIOXIDE	UN1067	2.3	Not applicable
Air	Air, compressed	UN1002	2.2	Not available

Section 15: Regulatory Information

U.S. Regulations

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

SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release
Nitrogen Dioxide	Yes	No	Yes	No	Yes
Air	No	No	No	No	Yes

SARA 372.65

Nitrogen Dioxide	N/A
Air	Not regulated.

OSHA Process Safety

Nitrogen Dioxide	Not available
Air	Not regulated.

State Regulations

	CA Proposition 65
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Nitrogen Dioxide	Not regulated
Air	Not regulated.

Canadian Regulations

	WHMIS Classification
Nitrogen Dioxide	A, C, D1A, D2B, E
Air	A

National Inventory Status

	US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDL)
Nitrogen Dioxide	Listed on inventory.	Listed	Listed on inventory.
Air	Not listed on inventory.	Not listed.	Not determined.

Section 16: Other Information

	NFPA Rating
Nitrogen Dioxide	HEALTH=3 FIRE=0 REACTIVITY=0 SPECIAL=W-1 OX
Air	HEALTH=0 FIRE=0 REACTIVITY=0

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