

## Chemical Safety Data Sheet MSDS / SDS

## Nitrogen monoxide SDS

Revision Date:2024-04-25 Revision Number:1

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****Product identifier**

Product name: Nitrogen monoxide

CAS: 10102-43-9

**Relevant identified uses of the substance or mixture and uses advised against**

Relevant identified uses: For R&amp;D use only. Not for medicinal, household or other use.

Uses advised against: none

**Company Identification**

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

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**SECTION 2: Hazards identification****Classification of the substance or mixture**

Oxidizing gases, Category 1

Gases under pressure: Compressed gas

Skin corrosion, Sub-category 1B  
Serious eye damage, Category 1  
Acute toxicity - Category 1, Inhalation

### GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

### Hazard statement(s)

H270 May cause or intensify fire; oxidizer  
H280 Contains gas under pressure; may explode if heated  
H314 Causes severe skin burns and eye damage  
H330 Fatal if inhaled

### Precautionary statement(s)

### Prevention

P220 Keep away from clothing and other combustible materials.  
P244 Keep valves and fittings free from oil and grease.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P264 Wash ... thoroughly after handling.  
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...  
P271 Use only outdoors or in a well-ventilated area.  
P284 [In case of inadequate ventilation] wear respiratory protection.

### Response

P370+P376 In case of fire: Stop leak if safe to do so.  
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P363 Wash contaminated clothing before reuse.  
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P316 Get emergency medical help immediately.  
P321 Specific treatment (see ... on this label).  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P305+P354+P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P317 Get medical help.  
P320 Specific treatment is urgent (see ... on this label).

#### **Storage**

P403 Store in a well-ventilated place.  
P410+P403 Protect from sunlight. Store in a well-ventilated place.  
P405 Store locked up.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

#### **Disposal**

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

#### **Other hazards which do not result in classification**

no data available

### **SECTION 3: Composition/information on ingredients**

#### **Substance**

Chemical name:	Nitrogen monoxide
Common names and synonyms:	Nitrogen monoxide
CAS number:	10102-43-9
EC number:	233-271-0
Concentration:	100%

### **SECTION 4: First aid measures**

#### **Description of necessary first-aid measures**

#### **If inhaled**

Fresh air, rest.

#### **Following skin contact**

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

#### **Following eye contact**

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

#### **Following ingestion**

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

#### **Most important symptoms/effects, acute and delayed**

Can cause death or permanent injury after a very short exposure to small quantities. Irritant of eyes, nose, throat; can cause unconsciousness. Nitric oxide forms acids in the respiratory system which are irritating and cause congestion in the lungs. Concentrations of 60-150 ppm cause immediate irritation of the nose and throat with coughing and burning in the throat and chest. 6-24 hours after exposure, labored breathing and unconsciousness may result. Concentrations of 100-150 ppm are dangerous for short exposure of 30-60 minutes. Concentrations of 200-700 ppm may be fatal after very short exposure. (EPA, 1998)

#### **Indication of immediate medical attention and special treatment needed, if necessary**

Basic treatment: Establish a patent airway. Suction if necessary. Aggressive airway management may be needed. Encourage patient to take deep breaths. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary. Monitor for shock and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. ... Nitrogen oxides (NOX) and related compounds

## **SECTION 5: Firefighting measures**

#### **Suitable extinguishing media**

Wear positive pressure breathing apparatus and full protective clothing. Move container from fire area if you can do so without risk. Stay away from ends of tanks. Spray cooling water on containers that are exposed to flames until well after fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. For small fires, use dry chemical or carbon dioxide. For large fires, use water spray, fog, or foam. (EPA, 1998)

#### **Specific hazards arising from the chemical**

Burns only when heated with hydrogen. With carbon disulfide, it reacts explosively with emission of light. When mixed with chlorine monoxide, can be explosive. Explodes on contact with nitrogen trichloride. When mixed with ozone, it will explode. Will

react with water or steam to produce heat and corrosive fumes. Reacts vigorously with reducing materials. When heated to decomposition, highly toxic fumes of nitrogen oxides are emitted. May ignite other combustible materials (wood, paper, oil, etc.). Mixture with fuels may explode. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors or in sewers. Reacts with oxygen to form poisonous nitrogen dioxide. Avoid storing in direct sunlight, or areas of high fire hazard. Incompatible with aluminum, boron, carbon disulfide, hypochlorite, chromium, fluorine, fuels, hydrocarbons, nitrogen trichloride, ozone, phosphorus, uns-dimethyl hydrazine, uranium, acetic anhydride, ammonia, barium oxide, boron trichloride, methyl chloride, 1,2-dichloroethane, dichloroethylene, ethylene, iron, magnesium, manganese, olefins, potassium, propylene, sodium, sulfur, trichloroethylene, 1,1,1-trichloroethane, uns-tetrachloroethane and reducing agents. (EPA, 1998)

#### **Special protective actions for fire-fighters**

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

### **SECTION 6: Accidental release measures**

#### **Personal precautions, protective equipment and emergency procedures**

Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Shut off cylinder if possible. Isolate the area until the gas has dispersed.

#### **Environmental precautions**

Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Shut off cylinder if possible. Isolate the area until the gas has dispersed.

#### **Methods and materials for containment and cleaning up**

1) ventilate area of leak or release to disperse gas. 2) stop flow of gas. if source ... is cylinder & leak cannot be stopped in place, remove ... cylinder to safe place in open air, & repair leak or allow ... to empty.

### **SECTION 7: Handling and storage**

#### **Precautions for safe handling**

NO contact with combustible substances. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### Conditions for safe storage, including any incompatibilities

Fireproof if in building. Keep in a well-ventilated room. IN GENERAL, MATERIALS WHICH ARE TOXIC AS STORED OR WHICH CAN DECOMP INTO TOXIC COMPONENTS ... SHOULD BE STORED IN A COOL, WELL-VENTILATED PLACE, OUT OF DIRECT RAYS OF SUN, AWAY FROM AREAS OF HIGH FIRE HAZARD, & SHOULD BE PERIODICALLY INSPECTED ... INCOMPATIBLE MATERIALS SHOULD BE ISOLATED .

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

TLV: 25 ppm as TWA; BEI issued. MAK: 0.63 mg/m<sup>3</sup>, 0.5 ppm; peak limitation category: I(2); pregnancy risk group: D. EU-OEL: 2.5 mg/m<sup>3</sup>, 2 ppm as TWA

### Biological limit values

no data available

### Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### Individual protection measures, such as personal protective equipment (PPE)

#### Eye/face protection

Wear safety goggles or eye protection in combination with breathing protection.

#### Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

#### Respiratory protection

Use ventilation.

#### Thermal hazards

no data available

## SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Nitric oxide is a colorless gas. Noncombustible but accelerates the burning of combustible material. Vapors heavier than air. Very toxic by inhalation and skin absorption. Heating the containers may cause them to rupture violently and rocket.
Colour:	COLORLESS GAS; BLUE LIQ
Odour:	Sharp, sweet odor
Melting point/freezing point:	-163.6°C(lit.)
Boiling point or initial boiling point and boiling range:	?151.7°C(lit.)
Flammability:	Nonflammable Gas, but will accelerate the burning of combustible materials.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	no data available
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	0.0188 cP at 25 deg C @ 101.325 KPa (gas)
Solubility:	5 % (NIOSH, 2016)
Partition coefficient n-octanol/water:	no data available

Vapour pressure:	26000 mm Hg at 68° F (EPA, 1998)
Density and/or relative density:	1.24 g/cm <sup>sup</sup> >3
Relative vapour density:	1.05 (vs air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

### Reactivity

The substance is a strong oxidant. It reacts with combustible and reducing materials.

### Chemical stability

no data available

### Possibility of hazardous reactions

BURNS ONLY WHEN HEATED WITH HYDROGENNITRIC OXIDE can serve as both an oxidizing agent and as a reducing agent. Sustains the combustion of powdered aluminum [Mellor 5:209-212. 1946-47]. Enflames or explodes when mixed with vapors of carbon disulfide [Mellor 8, Supp. 2:232. 1967]. Reacts vigorously with sodium monoxide above 100°C [Mellor 2, Supp. 2:629. 1961]. Reacts on contact with oxygen at room temperature to form brown gaseous nitrogen dioxide. Reacts with alkalis to form nitrates and nitrites [Merck 11th ed. 1989]. The liquid is very sensitive to detonation in the presence of water.

### Conditions to avoid

no data available

### Incompatible materials

Will react with water or steam to produce heat & corrosive fumes

### Hazardous decomposition products

When heated to decomp, it emits highly toxic fumes of /nitrogen oxides/ .



## SECTION 11: Toxicological information

### Acute toxicity

Oral: no data available

Inhalation: no data available

Dermal: no data available

### Skin corrosion/irritation

no data available

### Serious eye damage/irritation

no data available

### Respiratory or skin sensitization

no data available

### Germ cell mutagenicity

no data available

### Carcinogenicity

no data available

### Reproductive toxicity

no data available

### STOT-single exposure

Inhalation of high concentrations of the gas may cause damage to the lungs.

### STOT-repeated exposure

Repeated or prolonged inhalation may cause effects on the lungs.

### **Aspiration hazard**

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

## **SECTION 12: Ecological information**

### **Toxicity**

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

### **Persistence and degradability**

no data available

### **Bioaccumulative potential**

no data available

### **Mobility in soil**

no data available

### **Other adverse effects**

no data available

## **SECTION 13: Disposal considerations**

### **Disposal methods**

#### **Product**

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

### **Contaminated packaging**

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

## **SECTION 14: Transport information**

### **UN Number**

ADR/RID: UN1660 (For reference only, please check.)

IMDG: UN1660 (For reference only, please check.)

IATA: UN1660 (For reference only, please check.)

### **UN Proper Shipping Name**

ADR/RID: NITRIC OXIDE, COMPRESSED (For reference only, please check.)

IMDG: NITRIC OXIDE, COMPRESSED (For reference only, please check.)

IATA: NITRIC OXIDE, COMPRESSED (For reference only, please check.)

### **Transport hazard class(es)**

ADR/RID: 2.3 (For reference only, please check.)

IMDG: 2.3 (For reference only, please check.)

IATA: 2.3 (For reference only, please check.)

### **Packing group, if applicable**

ADR/RID: (For reference only, please check.)

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

### **Environmental hazards**

ADR/RID: No

IMDG: No

IATA: No

### **Special precautions for user**

no data available

**Transport in bulk according to IMO instruments**

no data available

## **SECTION 15: Regulatory information**

**Safety, health and environmental regulations specific for the product in question**

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

Listed.

**EC Inventory**

Listed.

**United States Toxic Substances Control Act (TSCA) Inventory**

Listed.

**China Catalog of Hazardous chemicals 2015**

Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Listed.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Listed.

**IECSC)**

Listed.

**Korea Existing Chemicals List (KECL)**

Listed.

## SECTION 16: Other information

### Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

### References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:  
<http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

### Other Information

There is no odour warning even when toxic concentrations are present. Contact with air generates nitrogen dioxide. See ICSC 0930.

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any