

Safety Data Sheet

Nitric Oxide - Balance Nitrogen

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Reference number: 1485
Version: 1.0

Warning



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

1.1. Product identifier

Trade name : Nitric Oxide - Balance Nitrogen
SDS no : 1485

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : Industrial and professional uses. Perform risk assessment prior to use.
Industrial and professional use for chemical analysis, calibration, (routine) quality control,
laboratory use, under controlled conditions.
Medical applications.

Uses advised against : Consumer use.
Uses other than those listed above are not supported, contact your supplier for more
information on other uses.

1.3. Details of the supplier of the safety data sheet

Company identification : Green ASU Plant Private Limited
Whitefield Road, Mahadevapura Post
560048 Bangalore
T 9740756696, 7760976502 & 080-41818200
<https://www.solgroup.com/it/safety-datasheet>
msds@sol.it

1.4. Emergency telephone number

Emergency telephone number : 9740756696, 7760976502 & 080-41818200

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards Gases under pressure : Compressed gas H280

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS04

Signal word (CLP) : Warning
Hazard statements (CLP) : H280 - Contains gas under pressure; may explode if heated.
Precautionary statements (CLP)
- Storage : P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

Not classified as PBT or vPvB.
The substance/mixture has no endocrine disrupting properties.

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SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Nitrogen Compressed	CAS-No.: 7727-37-9 EC-No.: 231-783-9 EC Index-No.: --- REACH-no: *1	99.9	Press. Gas (Comp.), H280
Nitric oxide	CAS-No.: 10102-43-9 EC-No.: 233-271-0 EC Index-No.: --- REACH-no: 01-2120766630-54	0.1	Ox. Gas 1, H270 Press. Gas (Comp.), H280 Skin Corr. 1B, H314 Eye Dam. 1, H318 Acute Tox. 1 (Inhalation:gas), H330

Name	Product identifier	Specific concentration limits
Nitric oxide	CAS-No.: 10102-43-9 EC-No.: 233-271-0 EC Index-No.: --- REACH registration No: 01-2120766630-54	(0.5 ≤ C ≤ 100) STOT SE 3, H335

Full text of H- and EUH-statements: see section 16

Contains no other components or impurities which will influence the classification of the product.

*1: Listed in Annex IV / V REACH, exempted from registration.

*3: Registration not required: Substance manufactured or imported < 1t/y.

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- Skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

May cause irritation to cornea (with temporary disturbance to vision).
May cause irritation to skin.
Material is destructive to tissue of the mucuous membranes and upper respiratory tract.
Cough, shortness of breath, headache, nausea.
See section 11.

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.
Treat with corticosteroid spray as soon as possible after inhalation.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
Product does not burn, use fire control measures appropriate for the surrounding fire.

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- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products : None that are more hazardous than the product itself.

5.3. Advice for firefighters

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
If possible, stop flow of product.
Use water spray or fog to knock down fire fumes if possible.
Move containers away from the fire area if this can be done without risk.

Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Act in accordance with local emergency plan.
Try to stop release.
Evacuate area.
Ensure adequate air ventilation.
Stay upwind.
See section 8 of the SDS for more information on personal protective equipment.

For emergency responders : Monitor concentration of released product.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
See section 5.3 of the SDS for more information.

6.2. Environmental precautions

Try to stop release.
Reduce vapour with fog or fine water spray.

6.3. Methods and material for containment and cleaning up

Hose down area with water.
Wash contaminated equipment or sites of leaks with copious quantities of water.

6.4. Reference to other sections

See also sections 8 and 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe use of the product

: The product must be handled in accordance with good industrial hygiene and safety procedures.
Only experienced and properly instructed persons should handle gases under pressure.
Consider pressure relief device(s) in gas installations.
Ensure the complete gas system was (or is regularly) checked for leaks before use.
Do not smoke while handling product.
Avoid exposure, obtain special instructions before use.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Installation of a cross purge assembly between the container and the regulator is recommended.
Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service.
Avoid suck back of water, acid and alkalis.
Do not breathe gas.
Avoid release of product into work area.

Safe handling of the gas receptacle

: Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
Protect containers from physical damage; do not drag, roll, slide or drop.
When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
If user experiences any difficulty operating valve discontinue use and contact supplier.
Never attempt to repair or modify container valves or safety relief devices.
Damaged valves should be reported immediately to the supplier.
Keep container valve outlets clean and free from contaminants particularly oil and water.
Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
Close container valve after each use and when empty, even if still connected to equipment.
Never attempt to transfer gases from one cylinder/container to another.
Never use direct flame or electrical heating devices to raise the pressure of a container.
Do not remove or deface labels provided by the supplier for the identification of the content of the container.
Suck back of water into the container must be prevented.
Open valve slowly to avoid pressure shock.

7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers.
Containers should not be stored in conditions likely to encourage corrosion.
Container valve guards or caps should be in place.
Containers should be stored in the vertical position and properly secured to prevent them from falling over.
Stored containers should be periodically checked for general condition and leakage.
Keep container below 50°C in a well ventilated place.
Store containers in location free from fire risk and away from sources of heat and ignition.
Keep away from combustible materials.

7.3. Specific end use(s)

None.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nitric oxide (10102-43-9)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Nitric oxide
ACGIH OEL TWA [ppm]	25 ppm
Remark (ACGIH)	TLV® Basis: Hypoxia/cyanosis; nitrosyl-Hb form; URT irr. Notations: BEIM
Regulatory reference	ACGIH 2023

DNEL (Derived-No Effect Level) : None established.

PNEC (Predicted No-Effect Concentration) : None established.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation.
Product to be handled in a closed system.
Systems under pressure should be regularly checked for leakages.
Ensure exposure is below occupational exposure limits (where available).
Gas detectors should be used when toxic gases may be released.
Consider the use of a work permit system e.g. for maintenance activities.

8.2.2. Individual protection measures, e.g. personal protective equipment

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.

The following recommendations should be considered:

PPE compliant to the recommended EN/ISO standards should be selected.

- Eye/face protection : Wear goggles and a face shield when transfilling or breaking transfer connections.
Standard EN 166 - Personal eye-protection - specifications.
Provide readily accessible eye wash stations and safety showers.
- Skin protection
 - Hand protection : Wear chemically resistant protective gloves.
Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher. Recommended types include wrist gloves from leather or synthetic material with equivalent performance, fabric gloves, fabric gloves with leather palms.
Standard EN 374 - Protective gloves against chemicals.
Consult glove manufacturer's product information on material suitability and material thickness.
 - Other : The breakthrough time of the selected gloves must be greater than the intended use period.
: Keep suitable chemically resistant protective clothing readily available for emergency use.
Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.
Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Respiratory protection : Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
Consult respiratory device supplier's product information for the selection of the appropriate device.
When indicated by a risk assessment, Respiratory Protective Equipment must be used. The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD.
Keep self contained breathing apparatus readily available for emergency use.
Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.

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• Thermal hazards : None in addition to the above sections.

8.2.3. Environmental exposure controls

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

- Physical state at 20°C / 101.3kPa : Gas.
- Colour : Mixture contains one or more component(s) which have the following colour(s):
Colourless Brownish gas.

Odour

: Odour threshold is subjective and inadequate to warn of overexposure.
Mixture contains one or more component(s) which have the following odour:
Pungent.
Odour threshold is subjective and inadequate to warn of overexposure.

Melting point / Freezing point

: Not applicable for gases and gas mixtures.

Boiling point

: Not applicable for gas mixtures.
It is technically not possible to determine the boiling point or range of this mixture.
Component with lowest boiling point: Nitrogen Compressed -196 °C

Flammability

: Non flammable.

Lower explosion limit

: Not available

Upper explosion limit

: Not available

Flash point

: Not applicable for gases and gas mixtures.

Auto-ignition temperature

: Non flammable.

Decomposition temperature

: Not applicable.

pH

: Not applicable for gases and gas mixtures.

Viscosity, kinematic

: Not applicable for gases and gas mixtures.

Water solubility [20°C]

: Mixture is partially soluble in water

Partition coefficient n-octanol/water (Log Kow)

: Not available

Vapour pressure [20°C]

: Not applicable.

Vapour pressure [50°C]

: Not applicable.

Density and/or relative density

: Not applicable.

Relative vapour density (air=1)

: Lighter or similar to air.

Particle characteristics

: Not applicable for gases and gas mixtures.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Explosion limits : Non flammable.
Oxidising properties : No oxidising properties.

9.2.2. Other safety characteristics

Other data : None.

SECTION 10: Stability and reactivity

10.1. Reactivity

Data for mixtures are not available.

This mixture contains components with the following reactivity : Violently oxidises organic material.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None.

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10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Avoid moisture in installation systems.

10.5. Incompatible materials

For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity : Toxic if inhaled.

Nitric oxide (10102-43-9)

LC50 Inhalation - Rat [ppm]	57.5 ppm/4h
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Skin corrosion/irritation : Causes skin irritation.
Serious eye damage/irritation : Causes serious eye irritation.
Respiratory or skin sensitisation : No known effects from this product.
Germ cell mutagenicity : No known effects from this product.
Carcinogenicity : No known effects from this product.
Toxic for reproduction : Fertility : No known effects from this product.
Toxic for reproduction : unborn child : No known effects from this product.
STOT-single exposure : Severe corrosion to the respiratory tract at high concentrations.
STOT-repeated exposure : No known effects from this product.
Aspiration hazard : Not applicable for gases and gas mixtures.

11.2. Information on other hazards

Other information : The substance/mixture has no endocrine disrupting properties.

SECTION 12: Ecological information

12.1. Toxicity

Assessment : No ecological damage caused by this product.
 EC50 48h - Daphnia magna [mg/l] : No data available.
 EC50 72h - Algae [mg/l] : No data available.
 LC50 96 h - Fish [mg/l] : No data available.

12.2. Persistence and degradability

Assessment : No data available.

12.3. Bioaccumulative potential

Assessment : No data available.

12.4. Mobility in soil

Assessment : Because of its high volatility, the product is unlikely to cause ground or water pollution.
Partition into soil is unlikely.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

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12.6. Endocrine disrupting properties

Assessment : The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.
Effect on the ozone layer : No effect on the ozone layer.
Effect on global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Contact supplier if guidance is required.
Must not be discharged to atmosphere.
Ensure that the emission levels from local regulations or operating permits are not exceeded.
Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods.
Return unused product in original container to supplier.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 04 *: Gases in pressure containers (including halons) containing hazardous substances.

13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transport information

14.1. UN number or ID number

In accordance with DOT/ TDG/ Mexico/ IMDG / IATA
UN-No. : 3304

14.2. UN proper shipping name

Transport by road/rail/inland waterways (DOT/TDG/Mexico)	: COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. (Nitric oxide, Nitrogen Compressed)
Transport by air (IATA-DGR)	: Compressed gas, toxic, corrosive, n.o.s. (Nitric oxide, Nitrogen Compressed)
Transport by sea (IMDG)	: COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. (Nitric oxide, Nitrogen Compressed)

14.3. Transport hazard class(es)

Labelling :  
2.3 : Toxic gases.
8 : Corrosive substances.

Transport by road/rail/inland waterways (DOT/TDG/Mexico)

Class : 2
Classification code : 1TC
Hazard identification number : 268
Tunnel Restriction : C/D - Tank carriage: Passage forbidden through tunnels of category C, D and E. Other carriage: Passage forbidden through tunnels of category D and E

Transport by air (DOT/TDG/Mexico)

Class / Div. (Sub. risk(s)) : 2.3 (8)

Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 2.3 (8)
Emergency Schedule (EmS) - Fire : F-C
Emergency Schedule (EmS) - Spillage : S-U

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14.4. Packing group

Transport by road/rail/inland waterways (DOT/TDG/Mexico) : Not applicable.
 Transport by air (IATA-DGR) : Not applicable.
 Transport by sea (IMDG) : Not applicable.

14.5. Environmental hazards

Transport by road/rail/inland waterways (DOT/TDG/Mexico) : None.
 Transport by air (IATA-DGR) : None.
 Transport by sea (IMDG) : None.

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail/inland waterways (DOT/TDG/Mexico) : P200.
 Transport by air (IATA-DGR)
 Passenger and Cargo Aircraft : Forbidden.
 Cargo Aircraft only : Forbidden.
 Transport by sea (IMDG) : P200.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment.
 Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
 Before transporting product containers:
 - Ensure there is adequate ventilation.
 - Ensure that containers are firmly secured.
 - Ensure valve is closed and not leaking.
 - Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
 - Ensure valve protection device (where provided) is correctly fitted.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU-Regulations

Restrictions on use : Contains no substance(s) listed on the REACH Candidate List.
 Other information, restriction and prohibition regulations : Contains no substance(s) listed on the PIC list (Regulation EU 649/2012 concerning the export and import of hazardous chemicals).
 Seveso Directive : 2012/18/EU (Seveso III) : Covered.

National regulations

Regulatory reference : Ensure all national/local regulations are observed.

15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

SECTION 16: Other information

Indication of changes : Safety data sheet in accordance with commission regulation (EU) No 2020/878.

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Abbreviations and acronyms

: ATE - Acute Toxicity Estimate.
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008.
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
EINECS - European Inventory of Existing Commercial Chemical Substances.
CAS# - Chemical Abstract Service number.
PPE - Personal Protection Equipment.
LC50 - Lethal Concentration to 50 % of a test population.
RMM - Risk Management Measures.
PBT - Persistent, Bioaccumulative and Toxic.
vPvB - Very Persistent and Very Bioaccumulative.
STOT- SE : Specific Target Organ Toxicity - Single Exposure.
CSA - Chemical Safety Assessment.
EN - European Standard.
UN - United Nations.
ADR - Agreement concerning the International Carriage of Dangerous Goods by Road.
IATA - International Air Transport Association.
IMDG code - International Maritime Dangerous Goods.
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail.
WGK - Water Hazard Class.
STOT - RE : Specific Target Organ Toxicity - Repeated Exposure.
UFI : Unique Formula Identifier.

Training advice

: Users of breathing apparatus must be trained.
Ensure operators understand the toxicity hazard.

Further information

: Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Data is maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at : <http://www.eiga.eu>.
Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).

Full text of H- and EUH-statements	
Acute Tox. 1 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 1
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
H270	May cause or intensify fire; oxidiser.
H280	Contains gas under pressure; may explode if heated.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
Ox. Gas 1	Oxidising Gases, Category 1
Press. Gas (Comp.)	Gases under pressure : Compressed gas
Skin Corr. 1B	Skin corrosion/irritation, Category 1, Sub-Category 1B
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation

DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
Details given in this document are believed to be correct at the time of going to press.
Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

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