

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

1.1. Product identifier

Commercial name	AZOGEN
Our code	484200 / 484200-2 / 4842005
Chemical description	Nitrogen 95%, Hydrogen 5% Chemical formula: N ₂ + H ₂

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

Industrial sector	Refrigeration, Air-conditioning and Automotive
Relevant identified uses	Refrigerant gas for refrigeration and air-conditioners systems
Application	Industrial and professional.

1.3. Details of the supplier of the safety data sheet



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1.4. Emergency telephone number

Mariel Srl	+39 0322 838319	Mon/Fri: 8.30-12.30 / 13.30-17.30
CAV-CNIT Anti-Poison (toxicological) National Information Centre	+39 0382 24444	Hours: 24 h / 24 h

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to in Regulation (EC) No 1272/2008

Physical hazards Liquefied Gas H280

2.2. Label elements

Dangerous pictogram



GHS04

Signal word Attention

Hazard statements (H) H280 Contains gas under pressure; may explode if heated

Precautionary statements (P)

Storage P410+P403 Protect from sunlight. Store in a well ventilated place.

Other information Contains greenhouse gases disciplined by Kyoto Protocol.

2.3. Other hazards

n.a.

3. Composition/information on ingredients

Material safety data sheet according regulation (EU) 2020/878
Version 5 – Date: 16th July, 2021 (replaces version 4 – 05/2019)

3.2. Mixtures

Substance name	%	Index No.	EC No.	CAS No.	REACH No.	Classification Regulation (CE) No. 1272/2008 (CLP)
Nitrogen	95%	-----	231-783-9	7727-37-9	*	Press. Gas (Liq.), H280
Hydrogen	5%	001-001-00-9	215-605-7	1333-74-0	*	Flam. Gas 1, H220 Press. Gas (Liq.), H280

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

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

For more information, see section 8, 11, 12 and 16.

SECTION 4: First aid measures



General information: If the person is unconscious, place it in the recovery position and get immediately medical attention. Do not give anything to an unconscious person. If breathing is irregular, give oxygen. If breathing stopped, administer artificial respiration. If symptoms persist, call a physician.

4.1. Description of first aid measures

Inhalation	Remove patient from exposure to fresh air. Administer oxygen if necessary. Obtain immediate medical attention.
Skin contact	Adverse effects not expected from this product.
Eye contact	Adverse effects not expected from this product.
Ingestion	Adverse effects not expected from this product.

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

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

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

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Water spray.
No suitable extinguishing media	High water jet.

5.2. Special hazards arising from the substance or mixture

The product is not flammable.

Specific hazards Contents under pressure.
On heating: heating will cause a rise in pressure with a risk of bursting. Toxic and corrosive vapours are released.
Cool down the containers exposed to heat with a water spray.
Vapours are heavier than air and can cause rapid suffocation by reducing oxygen available for breathing.

5.3. Advice for firefighters

Wear self-contained positive pressure breathing apparatus (SCBA) and protective suit.
Avoid contact with skin and eyes. Do not breathe gas/fumes/vapour.

SECTION 6: Accidental release measure

6.1. Personal precautions, protective equipment and emergency procedures

Immediately contact emergency personnel.
Immediately evacuate personnel to safe areas. Unprotected persons must be kept away.
Wear personal protective equipment refer to section 8 "Exposure controls/personal protection".
Remove all sources of ignition. Avoid contact with skin (possible frostbite).
Ventilate the area/local. In case of insufficient ventilation, wear self-contained breathing apparatus.

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6.2. Environmental precautions

Do not allow product to spread into the environment.
Avoid spillage and prevent possible losses.

6.3. Methods and material for containment and cleaning up

Ventilate / aerate the area or local.

6.4. Reference to other sections

For further on personal protection, refer to section 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Technical measures	Handle and open container with care. Caution when opening, pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50° C (122 °F). Do not spray on a naked flame or any incandescent material. Do not use in area without adequate ventilation. Do not pierce or burn, even after use. Follow the general precautions for handling, storing, and using compressed gases.
Industrial hygiene	Ensure adequate ventilation of the working area. Do not drink, eat or smoke in the working area.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers

Keep containers tightly closed in a dry, cool and well-ventilated place, away from any ignition or heat sources.
Store in original container. Protect from sunlight and do not expose to temperatures exceeding 50° C (122 °F).

7.3. Specific end use(s)

For professional and industrial use only.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL (Occupational Exposure Limit): No data available
DNEL (Derived No Effect Level): No data available
PNEC (Predicted No Effect Concentration): No data available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Ensure adequate ventilation. In case of insufficient ventilation, wear self-contained breathing apparatus. Wash the hands before and after using the gas. Do not smoke. Personal protective equipment must comply with EU directives: respiratory protective equipment EN 136, 140, 149; eye protection (protective goggles or safety glasses) EN 166; skin protection EN 340, 463, 468, 943-1, 943-2; hands protection (protective gloves) EN374, safety boots EN ISO 20345.

8.2.2 Individual protection measures, such as personal protective equipment

- | | |
|------------------------|---|
| a) Eye/face protection | Safety glasses with side-shields (according to directive EN 166). |
| b) Skin protection | |
| i) Hand protection | Thermal-protective gloves resistant to chemical products (EN 374).
Protective gloves against mechanical risk (EN 388) when handling gas containers.
Cold insulating gloves (EN 511) when trans-filling or breaking transfer connections.
The penetration time of the gloves must be greater than the period of expected use. |
| ii) Other | Wear safety shoes (EN ISO 20345) while handling containers.
Apron or protective clothing are not necessary. |

c) Respiratory protection

Mask filter for gases and vapours (EN141). To obtain an adequate protection, filter class you should choose according to the type and concentration of contaminants. The breathing apparatus with filters do not operate satisfactorily when the air contains high concentrations of vapours. In case of insufficient ventilation, wear self-contained breathing apparatus (EN529).



8.2.3. Environmental exposure controls

Handling in accordance with good industrial hygiene and safety practice. Prevent spillage or leakage of the product in watercourse or sewers (explosion danger). Avoid air emissions. See section 7 and 13.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

a) Physical state:	Gas
b) Colour:	Colourless
c) Odour:	Odourless
d) Melting point/freezing point:	H2: -259 °C @ 1,013 bar N2: -210 °C @ 1,013 bar
e) Boiling point or initial boiling point and boiling range:	H2: -253 °C @ 1,013 bar N2: -196 °C @ 1,013 bar
f) Flammability:	No flammable gas
g) Lower and upper explosion point:	H2: 4%÷75,6% N2: No flammable gas
h) Flash point:	Not applicable to gases and gas mixtures
i) Auto-ignition temperature:	No flammable gas
j) Decomposition temperature:	n.a.
k) pH:	Not applicable to gases and gas mixtures
l) Kinematic viscosity:	Not applicable to gases and gas mixtures
m) Solubility (in water):	H2: 1,6 mg/l @ 15 °C N2: 20 mg/l @ 15 °C
n) Partition coefficient n-octanol/water (log value):	n.a.
o) Vapour pressure:	n.a.
p) Density and/or relative density:	H2: 0,07 N2: 0,97
q) Relative vapour density:	0,94 @ 15 °C (by calculation)
r) Particle characteristics:	Not applicable to gases and gas mixtures

9.2. Other information

Molecular mass	H2: 2 g/mol.	N2: 28 g/mol.
Critical temperature	H2: -239,9 °C @ 12,98 bar	N2: -146,95 °C @ 33,99 bar

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal handling and storage conditions.

10.2. Chemical stability

Stable under normal handling and storage conditions.

10.3. Possibility of hazardous reactions

This product is non-reactive under normal handling and storage conditions.

10.4. Conditions to avoid

Contains under pressure, may explode if heated.

Protect from sunlight and do not expose to temperatures exceeding 50 °C.

Keep away from heat, sparks, open flame or other sources of ignition. Do not smoke.

Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material.

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10.5. Incompatible materials

No reaction with common materials in dry or wet conditions.

10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information

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

a) Acute toxicity	Based on available data, the classification criteria are not met.
b) Skin corrosion/irritation	Based on available data, the classification criteria are not met.
c) Serious eye damage/irritation	Based on available data, the classification criteria are not met.
d) Respiratory sensitisation	Based on available data, the classification criteria are not met.
e) Germ cell mutagenicity	Based on available data, the classification criteria are not met.
f) Carcinogenicity	Based on available data, the classification criteria are not met.
g) Reproductive toxicity	Based on available data, the classification criteria are not met.
h) STOT – single exposure	Based on available data, the classification criteria are not met.
i) STOT – repeated exposure	Based on available data, the classification criteria are not met.
j) Aspiration hazard	Based on available data, the classification criteria are not met.

11.2. Information on other hazards

None.

SECTION 12: Ecological information

12.1. Toxicity

No ecological damage caused by this product.

Fish	CL50 96 h (mg/l): No data available
Aquatic invertebrates	EC50 48 h (mg/l): No data available
Algae	EC50 72 h (mg/l): No data available

12.2. Persistence and degradability

No ecological damage caused by this product.

12.3. Bioaccumulative potential

No ecological damage caused by this product.

12.4. Mobility in soil

No ecological damage caused by this product.

12.5. Results of PBT and vPvB assessment

This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Ozone Depletion Potential	ODP (R-11=1) = 0
Global Warming Potential	GWP (CO2=1) = 0

SECTION 13: Disposal consideration

13.1. Waste treatment methods

General information	Take all necessary measures to prevent the production of residuals, value the possible methods of regeneration or recycling. Do not discharge into drains or environment. Dispose of contents and container in accordance with Directive 2008/98/EC and all local, regional, national or international regulations.
Disposal method	Refer to the EIGA Practice Code (Doc. 30 "Gas Disposal", downloadable from http://www.eiga.org) for better guidance on the disposal methods available. Contact the supplier for the correct disposal of the container. Discharging, treatment or disposal may be subject to national, state or local regulations.

European Waste Code (EWC)

Product 16 05 05* Gases in pressure containers other than those mentioned in 16 05 04.

Packaging 15 01 11* Metallic packaging containing a hazardous solid porous matrix (for example asbestos), including empty pressure containers.

SECTION 14: Transport information

14.1. UN number or ID number

ADR-RID-ADN-IMDG-ICAO UN 1956

14.2. UN proper shipping name

ADR-RID-ADN-IMDG-ICAO COMPRESSED GAS, N.O.S. (95% Nitrogen 5% Hydrogen)

14.3. Transport hazard class(es)

ADR-RID-ADN: 2

IMDG-ICAO: 2.2



Label: 2.2

Additional information

Tunnel restriction code (ADR) E

EmS (IMDG) F-C, S-V

14.4. Packing group

ADR-RID-ADN-IMDG-ICAO n.a.

14.5. Environmental hazards

Dangerous for the environmental NO

Maritime pollution NO

14.6. Special precautions for user

The transport, including loading and unloading, must be carried out by persons who have received appropriate training concerning required by the modal regulations.

Road transport must be carried out by vehicles authorized for the transport of dangerous goods in accordance with the requirements of the current edition of the ADR Agreement and the applicable national provisions. 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.

Ensure that containers are firmly secured. Ensure there is adequate ventilation.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH):

Hydrogen (CAS No 1333-74-0) Concentration 1,0 – 10%

Regulation (EC) No 1272/2008 (CLP), Part 3 of Annex VI, denomination 40: Gas under pressure, Gas compressed.

Regulation (EU) No 517/2014 on fluorinated greenhouse gases (F-GAS): GWP 0

Directive 2004/42/CE on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (VOC): Not included

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

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work:

Hydrogen (CAS No 1333-74-0) Concentration 1,0 – 10%

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Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances - Seveso III:

Hydrogen (CAS No 1333-74-0) Included (P2)

Directive 92/85/EC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding.

Directive 2003/105/EC on the control of major-accident hazards involving dangerous substances.

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work.

Council Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment.

National standards

Adoption of National legislation on working with chemical agents.

National adoption of EU Directives concerning control of major-accident hazards involving dangerous substances (Directive 2012/18/CE).

National adoption of EU Directives concerning health and safety on the workplace.

Relevant national laws (National adoption of Directive 92/85/EEC).

15.2. Chemical safety assessment

No Chemical Safety Assessment (CSA) has been made for this product.

SECTION 16: Other information

This Material Safety Data Sheet has been made according European Directive in force.

Text of hazard (H) and precautionary (P) statements in section 2 and 3

H280 Contains gas under pressure; may explode if heated
 P410+P403 Protect from sunlight. Store in a well ventilated place.

Text of "Hazard Class and Category Code" in section 2 and 3, according to Regulation (EC) No 1272/2008

Press. Gas (Liq.) Gases under pressure : Liquefied gas
 Flam. Gas 1 Flammable gas, category 1

History	Version 5 by Mariel Srl	Version 4	Version 3	Version 2	Version 1
	Revision date: 07/2021	Date: 05/2019	Date: 03/2017	Date: 05/2015	Date: 10/2014

b) Abbreviations and acronyms

ADN	Agreement Dangerous goods by inland waterways
ADR	Accord Dangerous Route
CAS	Chemical Abstracts Service number
CE / EC	European Community
CLP	Classification, Labelling, Packaging
CSA	Chemical Safety Assessment
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50%
EIGA	European Industrial Gases Association
EmS	Emergency Schedule
EWC	European Waste Code
GHS	Globally Harmonised System
GWP	Global Warming Potential
HCFC	Hydro-Chloro-Fluoro-Carbons
HFC	Hydro-Fluoro-Carbons
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
IMDG	International Maritime Dangerous Goods code
LC50	Lethal Concentration 50%
LOAEC	Lowest Observed Adverse Effect Concentration
Log Koc	Logarithm Partition coefficient Soil/water
Log Pow (Kow)	Logarithm Partition coefficient n-Octanol/water
n.a.	not applicable / not available
NOAEC	No Observed Adverse Concentration Level
NOAEL	No Observed Adverse Effect Level
ODP	Ozone Depleting Potential

OEL	Occupational Exposure Limit
PBT	Persistent Bio-accumulative Toxic
PNEC	Predicted No Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Rail International Dangerous goods transport
STOT-RE	Specific Target Effect Concentration-repeated exposure
STOT-SE	Specific Target Effect Concentration-single exposure
TLV	Threshold Limit Value
TWA	Time Weighted Average
UE / EU	European Union
vPvB	very Persistent very Bioaccumulative

Notice of liability

This information should not constitute a guarantee for any specific product properties. This information are only a guidance for safe handling, use, processing, storage, transportation, disposal and release and are not to be considered a warranty or a quality specification.

The information contained in this safety data sheet are based on our current knowledge and EU and national laws; they describe the product only with regard to safety requirements. The conditions of the user are beyond our knowledge and control. The product should not be used for purpose other than those specified. It is always the responsibility of the user to take all the necessary measures to comply with the requirements of current legislation. The information contained in this form should not be considered as a guarantee of its properties.
