

SAFETY DATA SHEET**Product: AMÔNIA FERTILIZANTE**

Version: 01

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SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification of the product	AMÔNIA FERTILIZANTE
Recommended uses	Used in the fertilizer, pharmaceutical, textile and industrial refrigeration industries.
Restrictions on use	Not recommended for other uses.
Company	Proquigel Química S/A.
Address:	Rua Eteno, nº 2198 – Polo Industrial de Camaçari - Camaçari/BA, CEP: 42.816-200, Brazil.
Telephone number	55 (71) 3483-5022
Company	Proquigel Química S/A.
Address:	Rodovia SE 211, Km 01 – Pedra Branca – Laranjeiras/SE. CEP: 49.170-000, Brazil.
Telephone number	55 (79) 3281-5222
Emergency telephone number	0800 110 8270 Pró-Química

SECTION 2: HAZARDS IDENTIFICATION

Most important hazards	Contains gas under pressure; may explode if heated. Causes severe skin burns and eye damage. Causes serious eye damage. Toxic if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes damage to respiratory system. Causes damage to respiratory system through prolonged or repeated exposure. Very toxic to aquatic life with long lasting effects.
Product effects	
Adverse effects to the human health	Toxic if inhaled with burning sensation, cough, difficult breathing, shortness of breath and sore throat. Causes severe skin to burn with pain, blistering and peeling of the skin. The skin may become white or

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	<p>yellowish, with a waxy appearance. Causes serious eye damage with watering, pain, eyelid edema, corneal ulceration, and iris atrophy. It can lead to blindness. The contact of the liquefied gas with the eyes and the skin can cause “cold burns” (frostbite). It can cause allergic or asthmatic symptoms and breathing difficulties with cough and shortness of breath. It causes lung damage with irritation, edema and hemorrhage. In high concentrations it can cause respiratory arrest, cardiac arrhythmia, and death from suffocation. Repeated and prolonged exposure to the product can cause permanent lung damage.</p>
Environmental effects	Very toxic to aquatic life with long lasting effects.
Physical and chemical hazards	Contains gas under pressure; may explode if heated.
Chemical product-specific hazards	It is not expected that product presents specific hazards.
Important symptoms	If inhaled with burning sensation, cough, difficult breathing, shortness of breath and sore throat. Skin: burn with pain, blistering and peeling of the skin. Eye: watering, pain, eyelid edema, corneal ulceration, and iris atrophy. It can lead to blindness. The contact of the liquefied gas with the eyes and the skin can cause “cold burns” (frostbite). It can cause allergic or asthmatic symptoms and breathing difficulties with cough and shortness of breath. It causes lung damage with irritation, edema, and hemorrhage. In high concentrations it can cause respiratory arrest, cardiac arrhythmia, and death from suffocation. Repeated and prolonged exposure to the product can cause permanent lung damage.
Classification of the chemical product	Gas under pressure – Liquefied gas. Acute toxicity – Inhalation – Category 3. Skin corrosion/irritation – Category 1A. Serious eye damage/eye irritation – Category 1. Respiratory sensitization – Category 1. Specific target organ toxicity – Single exposure – Category 1. Specific target organ toxicity – Repeated exposure – Category 1. Hazardous to the aquatic environment – Short -term (Acute) – Category 1. Hazardous to the aquatic environment – Long term (Chronic) –

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Category 1.

Classification system adopted Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations, 2019.

Adequate labeling elements

Pictograms



Signal word

DANGER

Hazard statement(s)

H280 Contains gas under pressure; may explode if heated.
 H314 Causes severe skin burns and eye damage.
 H318 Causes serious eye damage.
 H331 Toxic if inhaled.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H370 Causes damage to respiratory system.
 H372 Causes damage to respiratory system through prolonged or repeated exposure.
 H400 Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P260 Do not breathe gas.
 P264 Wash hands thoroughly after handling.
 P270 Do not eat, drink, or smoke when using his product.
 P273 Avoid release to the environment.
 P280 Wear protective gloves, protective clothing, eye protection, face protection and hearing protection.

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P391 Collect spillage.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable breathing.

P308 + P316 IF exposed or concerned: Get emergency medical help immediately.

P342 + P316 If experiencing respiratory symptoms: Get emergency medical help immediately.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P405 Store locked up.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

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

P501 Dispose of contents and container according to the current regulations.

Outline of an anticipated emergency

GAS UNDER PRESSURE HAZARDOUS TO HUMAN HEALTH AND ENVIRONMENT.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**SUBSTANCE**

Systematic chemical or trivial name Ammonia.

Common or generic name Ammonia anhydrous.

CAS Number 7664-41-7

Concentration: 99,5% (p/p)

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	Componentes	Concentration (%)	CAS Number
Impurities and stabilizing additives contributing to the hazard	Total residue	0.5 (p/p)	N.S.
	Oil	0.0001%	N.S.

N.S. Not Specified.

SECTION 4: FIRST-AID MEASURES**Exposure routes**

Inhalation	Remove the victim to a ventilated place and keep him at rest in a position that does not make breathing difficult. If you feel unwell, contact a TOXICOLOGICAL INFORMATION CENTER or a doctor. Take this SDS.
Skin contact	In case of contact of the product in pressurized form with the skin, injury or frostbite may occur. Immediately wash exposed skin with sufficient water. Clothes attached to the skin should be thawed with warm water before they are removed. Consult a doctor. Take this SDS.
Eye contact:	In case of contact of the product in the pressurized form with the eyes, injury or frostbite may occur (frostbite). Immediately wash your eyes with enough water, keeping your eyelids open. If using contact lenses, remove them if it is easy. Continue rinsing. Consult a doctor. Take this SDS.
Ingestion	Do not induce vomiting. Do not give anything by mouth to an unconscious person. Wash the victim's mouth with plenty of water. If vomiting occurs, tilt the patient forward or place him on the left side (upward if possible) to keep the airway open and avoid aspiration. Keep the patient silent and maintain normal body temperature. Consult a TOXICOLOGY CENTER or a doctor. Take this SDS.
Anticipated acute effects and/or anticipated delayed effects	Causes severe skin burns and eye damage. Causes serious eye damage. Toxic if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes damage to respiratory system. Causes damage to respiratory system through prolonged or repeated exposure.

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Most important symptoms/effects	If inhaled with burning sensation, cough, difficult breathing, shortness of breath and sore throat. Skin: burn with pain, blistering and peeling of the skin. Eye: watering, pain, eyelid edema, corneal ulceration, and iris atrophy. It can lead to blindness. The contact of the liquefied gas with the eyes and the skin can cause "cold burns" (frostbite). It can cause allergic or asthmatic symptoms and breathing difficulties with cough and shortness of breath. It causes lung damage with irritation, edema, and hemorrhage. In high concentrations it can cause respiratory arrest, cardiac arrhythmia, and death from suffocation. Repeated and prolonged exposure to the product can cause permanent lung damage
Protection of first aiders and/or special notes to a physician	Avoid contact with the product when helping the victim. Treatment of exposure should be directed towards the control of the patient's symptoms and clinical condition. In case of contact with the skin, do not rub the affected area.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media	Suitable: Stop the gas flow. Use water in CO ₂ fog or dry chemical powder to extinguish the flame. Use foggy water to cool containers exposed to flames. For fire involving liquid ammonia, use chemical powder or CO ₂ to fight it. Not recommended: Direct water jets, as they can cause freezing. Avoid using halogenated products.
Specific hazards arising from the chemical product	Gas with moderate fire risk, but a large amount and intense source of energy can cause ignition and / or explosion. Floats on water, producing a visible and toxic mist of vapor. The exothermic reaction with water produces heat that, in contact with other gases, can cause fire or explosion. The risk of flammability of ammonia manifests itself only in extreme fire conditions and in confined places. It forms an explosive mixture with mercury, oxides of silver and gold, sensitive to pressure and temperature. The risk is highest when depressurizing systems containing mercury and ammonia. It can decompose at high temperatures to form hydrogen, highly flammable, nitrogen monoxide and dioxide, irritating and toxic gases. The cylinders exposed to the phase can leak and release flammable gases through the fuse plugs

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	when they fuse. Broken cylinders can protrude.
Specific extinguishing methods	Fight the fire as far as possible or monitor the nozzles. If possible, fight downwind fire. Do not extinguish the fire before the leak is contained. Containers and tanks involved in the fire must be cooled with water fog.
Special equipment for the protection of firefighters	Self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions	Prevent sparks or flames. Do not smoke. Do not touch damaged containers or spilled material without wearing suitable clothing. Avoid exposure to the product. Stay away from low areas, with the wind behind you.
Protective equipment:	Use protective equipment as described in Section 8.
Emergency procedures	Wear PPE complete with safety glasses, PVC or latex safety gloves, suitable protective clothing, and closed shoes. The material used must be waterproof. The complete encapsulation garments must be used in leaks or spills without fire. In case of leakage, where exposure is large, it is recommended to use self-contained breathing apparatus (SCBA) with positive pressure. Isolate spills from ignition sources. Evacuate the area within a radius of at least 100 meters. Keep unauthorized persons away from the area. Stop the leak if it can be done without risk.
Environmental precautions	Prevent the dispersed gas from reaching water courses and sewage systems.
Methods and materials for containment	Containment techniques may include bunding, covering of drains and capping procedures.
Methods and materials for cleaning up	Stop the gas flow if it can be done safely. Slowly release the content into the atmosphere. Stay downwind. Do not pour water directly at the spill point. Due to the dispersion of the product in the environment, it is recommended that the area be ventilated until the site is released. For final destination, proceed according to Section 13 of this SDS.

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Secondary disaster prevention measures	For small spills of liquid, neutralize with a mixture of 5% hydrochloric acid. Use a vacuum cleaner. Drain to the sewer and dilute with sufficient water.
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SECTION 7: HANDLING AND STORAGE**Handling**

Precautions for safe handling	Avoid formation of fumes, vapors, or mists. Avoid exposure to the product. Avoid contact with incompatible materials. Avoid rupture of the pool submerged in water, abrupt rupture of the pressurized pool, rapid depressurization of the pool and water injection. Keep containers well identified and identified. Keep the cylinder valve protector (CAP) in position until the moment of use. Do not open the cylinder if it shows signs of damage. Use personal protective equipment as described in section 8.
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Technical measures for prevention of exposure of the handler	Use personal protective equipment as described in Section 8.
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Technical measures for prevention of fire and explosion	Schedule a first aid action before starting the activity with the product. The use of the product is restricted to professionals. Caution - Avoid exposure - obtain special instructions before use. Handle in a ventilated area or with a general local exhaust / compliance system.
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Suitable precautions	Contaminated clothing should be changed and washed before reuse. Remove clothing and protective equipment contaminated before entering eating areas.
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Prevention of contact	Wash hands and face thoroughly after handling and before eating, drinking, smoking, or going to the bathroom.
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Storage

Conditions for safe storage	Keep the product in a cool, dry place, protected from direct sunlight and fireproof. Store in spherical cylinders that meet local specifications, at room temperature and pressure of 15 kg / cm ² or in a tank designed at -33.3 °C and atmospheric pressure. The surface around the storage location of the cylinders must be covered with clay, asphalt, plastic wrap, or other impermeable material. Store in suitable
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tanks placed in the containment barrier in case of leakage. Engineering specifications must meet local regulations. There is no need to add stabilizers and antioxidants to ensure product durability. This product may react, in a dangerous manner, with some incompatible materials as outlined in Section 10.

Technical measures

Keep away from high temperatures, ignition sources and incompatible materials.

Incompatible substances and mixtures

Strong oxidizing agents, such as perchlorates, chlorates, nitrogen peroxide, chromium trioxide, nitrogen oxides, nitric acid, nitrile chloride or acids, acid anhydrides and acid chlorides. Acetaldehyde and halogens like chlorine, bromine, fluorine or interhalogens like bromine pentafluoride and chlorine tetrafluoride. Ethylene oxide.

Packaging materials
Recommended material

Similar to the original packaging.

Unsuitable material

It is not known unsuitable materials.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Permissible concentration

	Chemical or common name	TLV – TWA (ACGIH, 2020)	PEL – TWA (OSHA, 2019)	REL – TWA (NIOSH, 2019)
Occupational exposure limit	Ammonia	TWA 25 ppm STEL 35 ppm	50 ppm	25 ppm (ST) 35 ppm

ST: Short Term Exposure Limit.

Biological limit

Not established.

Engineering controls measures

Promote mechanical ventilation and a direct exhaust system to the outside environment. These measures help to reduce product exposure. Maintain atmospheric concentrations, of the constituents of the product, below the occupational exposure limits indicated.

Appropriate personal protective equipment

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Respiratory protection	It is recommended to use respiratory protective equipment with a respirator for gases and vapors. Based on the inhalation hazard of the product, a risk assessment must be carried out to adequately define respiratory protection in view of the conditions of use of the product.
Hand protection	Wear PVC chemical resistant gloves.
Eye protection	Wide vision safety glasses.
Skin and body protection	Suitable safety clothing and closed shoes. The material used should be waterproof.
Special precautions	Not established.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless gas. Colorless liquid under high pressure.
Odour	Spicy, extremely penetrating, irritating.
pH	11.6 (1.0 N aqueous solution).
Melting point/freezing point	-78 ° C.
Boiling point, initial boiling, and boiling range	33°C to 760 mmHg.
Flashpoint	Not applicable.
Upper/lower flammability or explosive limits	Higher: 28%. Lower: 15%.
Vapour pressure	7.51 x 10 ³ mmHg at 25 °C.
Vapour density	0.59 (air = 1).
Relative density	0.7 at -33 °C (water at 4 °C = 1).
Solubility(ies)	Soluble in water. Soluble in methanol, ether, chloroform and ethanol.
n-octanol/water partition coefficient	Log kow: 0.23.
Auto-ignition temperature	651°C.
Decomposition temperature	780°C.

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Odour threshold	5 ppm.
Evaporation rate	Not evaluated.
Flammability	Non-flammable gas. In large quantities and intense energy sources it can cause ignition and / or explosion.
Viscosity	1.18 cP at 20 °C (95%).
Other information	Not applicable.

SECTION 10: STABILITY AND REACTIVITY

Chemical stability	Product is stable under normal conditions of temperature and pressure.
Hazardous reactions	It can react violently or explosively with strong oxidizing agents such as perchlorates, chlorates, nitrogen peroxide, chromium trioxide, nitrogen oxides, nitric acid, nitrile chloride or acids, acid anhydrides, acid chlorides. It can react violently or form explosive products with acetaldehyde and halogens such as chlorine, bromine, fluorine or interhalogens such as bromine pentafluoride, chlorine tetrafluoride. Ethylene oxide can polymerize explosively in contact with ammoniacal nitrogen. The exothermic reaction of this substance with water can produce heat, which, in contact with other gases, can increase the risk of fire or explosion. It forms unstable compounds in the presence of high pressure and temperature with mercury, oxides of gold and silver.
Conditions to avoid	Avoid humidity, direct sunlight, sparks, sources of ignition, electrical discharge, flammable materials, or incompatible substances. Avoid extreme temperatures (above 52 ° C and below -29 ° C).
Incompatible materials	Strong oxidizing agents, such as perchlorates, chlorates, nitrogen peroxide, chromium trioxide, nitrogen oxides, nitric acid, nitrile chloride or acids, acid anhydrides and acid chlorides. Acetaldehyde and halogens like chlorine, bromine, fluorine or interhalogens like bromine pentafluoride and chlorine tetrafluoride. Ethylene oxide.
Hazardous decomposition products	Decomposition of the product can release ammonia, hydrogen oxides and carbon oxides.

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SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity	<p>Toxic if inhaled with burning sensation, cough, difficult breathing, shortness of breath and sore throat.</p> <p><u>Ammonia:</u> LC₅₀ (inhalation, rats, 14h): 2,000 ppm. Ammonia concentration of 348 mg/m³ can lead to death in humans.</p>
Skin irritation/corrosion	<p>Causes severe skin to burn with pain, blistering and peeling of the skin. The skin may become white or yellowish, with a waxy appearance.</p>
Eye damage/irritation	<p>Causes serious eye damage with watering, pain, eyelid edema, corneal ulceration, and iris atrophy. It can lead to blindness. The contact of the liquefied gas with the eyes and the skin can cause "cold burns" (frostbite).</p>
Respiratory or skin sensitization	<p>The product is not expected to cause skin sensitization.</p> <p>It can cause allergic or asthmatic symptoms and breathing difficulties with cough and shortness of breath. There is evidence in humans that exposure to ammonia causes asthma.</p>
Reproductive cell mutagenicity	<p>The product is not expected to cause germ cell mutagenicity.</p> <p><i>In vitro genotoxicity:</i> No evidence of mutagenicity was observed in an Ames test comparable to the guidelines performed with anhydrous ammonia.</p> <p><i>In vivo genotoxicity:</i> No evidence of an increase in the incidence of micronucleated polychromatic erythrocytes was observed in a mouse micronucleus assay performed with the compound.</p> <p>Ammonia is a simple molecule and has no structural alert for genotoxicity. Ammonia is present in relatively low levels in the systemic circulation as a consequence of protein catabolism (mainly in the liver) and is present in higher levels in the hepatic portal circulation due to the degradation of urea by gastrointestinal bacteria. The ubiquitous presence of ammonia leads us to the conclusion that it is unlikely to be genotoxic. The WHO assessment concludes that there is no evidence that ammonia is mutagenic in mammals. An assessment by the UK Health Protection Agency (HPA) similarly</p>

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	concludes that ammonia has no significant mutagenic potential.
Carcinogenicity	<p>The product is not expected to have a carcinogenic potential.</p> <p>Tests performed on rats through the administration of ammonia orally (ingestion of water containing ammonia), did not show any carcinogenic potential.</p>
Reproductive toxicity	<p>The product is not expected to cause reproductive toxicity.</p> <p>Reproductive toxicity tests with experimental animals, did not show that it causes toxic effects to reproduction.</p>
Specific target organ toxicity – single exposure	<p>It causes lung damage with irritation, edema and hemorrhage. In high concentrations it can cause respiratory arrest, cardiac arrhythmia and death from suffocation.</p> <p>Inhalation of ammonia, in humans, irritation of the upper respiratory tract, burning sensation in the nose, pharynx and trachea, dyspnoea, bronchial and alveolar edema, pulmonary edema, bronchopneumonia, muscle spasms of the hands and feet and visual disturbance were observed.</p>
Specific target organ toxicity – repeated exposure	Repeated and prolonged exposure to the product can cause permanent lung damage.
Aspiration hazard	It is not expected that the product presents aspiration hazard.
Toxicokinetics, metabolism and distribution	<p>Studies suggest that ammonia can be absorbed by the inhalation and oral routes of exposure, but there is less certainty regarding absorption through the skin. Absorption through the eye has been documented. Most of the inhaled ammonia is retained in the upper respiratory tract and is subsequently eliminated in expired air. Almost all of the ammonia produced endogenously in the intestinal tract is absorbed. Exogenous ammonia is also readily absorbed in the intestinal tract. Ammonia that reaches the circulation is widely distributed to all body compartments although substantial first pass metabolism occurs in the liver where it is transformed into urea and glutamine. Ammonia or ammonium ion reaching the tissues is taken up by glutamic acid, which participates in transamination and other reactions. The principal means of excretion of ammonia that reaches the circulation in mammals is as urinary urea; minimal amounts are</p>

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excreted in the feces and in expired air.

SECTION 12: ECOLOGICAL INFORMATION**Environmental effects, behavior, and fate of the product**

Ecotoxicity	Very toxic to aquatic organisms, with long lasting effects. LC ₅₀ (<i>Oncorhynchus gorbuscha</i> , 96h): 0.068 mg/L. NOEC (<i>Oncorhynchus gorbuscha</i> , 96h): 1.2 mg/L. LC ₅₀ (<i>Daphnia magna</i> , 48h): 101 mg/L. NOEC (<i>Daphnia magna</i> , 48h): 0.79 mg/L.
Persistence and degradability	The product does not have persistence and it is considered readily biodegradable.
Bioaccumulative potential	Presents low bioaccumulative potential in aquatic organisms. Log _{kow} : 0.23.
Mobility in soil	It is expected low to elevated mobility in soil.
Other adverse effects	Decomposition gases, like some nitrogen oxides, can contribute to the formation of acid rain. High concentrations of the product can impact the aquatic environment by decreasing the concentration of dissolved oxygen due to favoring and / or inducing the eutrophication process. The photolytic cycle of nitrogen oxides controls ozone concentrations at low altitude. However, the interference of hydrocarbons in the photolytic cycle can increase ozone concentrations, compromising the upper and lower airways, especially those most susceptible, such as children, the elderly and those with heart and lung diseases.

SECTION 13: DISPOSAL CONSIDERATIONS

Methods of disposal to the chemical product, product waste and/or contaminated container and/or packaging

Must be disposed of as hazardous waste in compliance with local regulations. The treatment and disposal should be evaluated for each specific product. Keep the product remains in its original and properly closed. Disposal should be performed as established for the product. Do not reuse empty containers. These may contain product residues and should be kept closed and sent for proper disposal as established

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for the product.

SECTION 14: TRANSPORT INFORMATION
International regulations

Land	UN – “United Nations” Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations
UN number	1005
UN proper shipping name	AMMONIA, ANHYDROUS
Transport hazard class(es)	2.3
Subsidiary risk	8
Packing group	N.A.
Sea	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN number	1005
UN proper shipping name	AMMONIA, ANHYDROUS
Transport hazard class(es)	2.3
Subsidiary risk	8
Packing group	N.A.
Environmental hazards	The product is considered a marine pollutant.
EmS	F-C, S-U.
Air	IATA – International Air Transport Association Dangerous Goods Regulation (DGR)
UN number	Not classified as hazardous to transport.
UN proper shipping name	FORBIDDEN (prohibited for air transport)
Transport in bulk according to MARPOL 73/78, Annex II, and the IBC Code	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006;

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- International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

Special precautions

There is no need of special precautions.

SECTION 15: REGULATORY INFORMATION

Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990.

International Organization for Standardization - ISO 11014:2009.

SECTION 16: OTHER INFORMATION

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

SDS elaborated january, 2021.

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

AIHA – American Industrial Hygiene Association

BCF – Bioconcentration Factor

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service

C – Ceiling

LC₅₀ – Lethal Concentration 50%

LD₅₀ – Lethal Dose 50%

ERPG - Emergency Response Planning Guidelines

LEL – Lower Explosive Limit

UEL – Upper Explosive Limit

NIOSH – National Institute of Occupational Safety and Health

OSHA – Occupational Safety & Health Administration

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PEL – Permissible Exposure Limit**REL** – Recommended Exposure Limit**STEL** – Short Term Exposure Limit**TLV** – Threshold Limit Value**TWA** – Time Weighted Average**Bibliographic references:**

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