

**ANHYDROUS AMMONIA GAS**

REVISION DATE: 09/17/2022

1. - PRODUCT AND COMPANY IDENTIFICATION

Product name: Ammonia anhydrous gas.

Internal Code of product identification: 11.01.0.

Company name: USIQUÍMICA DO BRASIL LTDA.

Address: Rua da Lagoa, 431 - Cumbica - Guarulhos - SP.

Company Phone: + 5511 3821-7000 (PBX system) - + 5511 2481-3355.

Emergency phone: SUATRANS - COTEC - Environmental Emergency.

DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.

193 – Firefighters.

Main recommended uses for the substance or mixture:

Used in the fertilizer, pharmaceutical, textile and industrial refrigeration industries.

2. - HAZARD IDENTIFICATION

Classification of Substance

Pressure gases, Liquefied Gas

Skin corrosion/irritation, category IA

Acute Toxicity - Oral, Category 3

Acute Toxicity - Dermal, category 3

Acute Toxicity - Inhalation, category 3

Specific organ toxicity - exp. Single, category 1

Specific organ toxicity - exp. Repeated, category 2

Serious eye damage/eye irritation, category 1

Respiratory sensitization, category 1

Skin sensitization, category 1 - subcategory IA and 1B

Aspiration hazard, category 1

Hazardous to the aquatic environment - Acute, category 1

Germ cell mutagenicity, category 2

Most important hazards: Liquefied gas under pressure, toxic and aggressive to the environment, with an extremely pungent odor, which makes it easy to detect by smell even at low concentrations.

Due to its great solubility in water, ammonia, in gaseous form, dissolves in the mucous membranes of the eyes and respiratory tract, exerting an intense irritating effect and cell damage due to its alkaline caustic action.

Product Effects: Toxic effect on human health.

Adverse effects on human health: Contact with liquid ammonia can cause severe eye and skin burns. Its toxic action on the mucous membranes interrupts breathing and impairs vision, even at low concentrations. May cause burns and suffocation. The concentration of 500 ppm causes irritation in the throat. 2000 ppm is dangerous for minor exposure and 5000 ppm can be fatal even for brief exposure.

Inhalation: Inhalation of gaseous ammonia, in high concentrations, can cause death.

Eye Contact: Liquid ammonia can cause severe eye burns and impairs vision even at low concentrations in the gaseous phase.

Skin contact: Liquid ammonia is a skin irritant that can cause skin burns.

Ingestion: It causes immediate corrosion and damage to the gastrointestinal tract.

Burns: Liquid ammonia can cause skin burns.

Adverse effects to the environment: Because it is very soluble in water and, even at low concentrations, it becomes harmful to aquatic life. Exposed animals may suffer tissue damage and lead to death. It burns the plants by dehydration.

Physical and chemical hazards: Ammonia is an alkaline product that releases heat when it reacts with acid. In contact with halogens, boron, alkyl sulfates 1,2 dichloroethane, ethylene oxides, platinum, nitrogen trichloride and strong oxidants, it can cause extremely exothermic or explosive reactions.

In contact with heavy metals and their compounds, it can form explosive products. Contact with chlorine and its compounds may result in the release of chloramine gas. Ammonia can produce significant explosive mixtures when in contact with hydrocarbons. The product is also incompatible with acetic aldehyde, acrolein, hydrazine and potassium ferrocyanide.

Specific hazards: Ammonia vaporizes quickly. Gas is lighter than air. Ammonia is stable when

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stored and used under normal conditions of storage and handling. Above 450°C can decompose, releasing nitrogen and hydrogen, the latter being highly flammable. No polymerization occurs.

Main symptoms: Inhalation can cause difficulty breathing, bronchospasm, burns to the mucous membranes of the mouth, pharynx and larynx, constriction and chest pain and salivation. Depending on the concentration and exposure time, the respiratory condition may evolve with edema and glottis spasm, asphyxia, cyanosis, pulmonary edema, respiratory arrest and death. Contact of liquid ammonia with the skin can cause severe burns. Exposure of the eyes to Ammonia in gaseous form can cause tearing, redness and swelling of the eyelids. Accidents with liquid ammonia in the eyes are always serious and can cause permanent loss of vision. Repeated exposure to the product may cause chronic bronchitis. Symptoms of ammonia poisoning begin with irritation of the eyes, nose and throat, followed by coughing, choking, chest pain and vomiting.

Emergency overview: Depending on the proportions, isolate and evacuate the area. Try to block the leak or transfer the product. Keep the wind blowing at your back. People should only be allowed access to contaminated areas if they are wearing protective clothing and a mask with supplemental air.

GHS label elements, including precautionary phrases.

LABEL ELEMENTS	DATA
Product identification and supplier emergency telephone number.	Commercial Name: ANHYDROUS AMMONIA GAS. Synonym: AMMONIA GAS. Emergency phone: SUATRANS - COTEC - Environmental Emergency. DDG (0800) 0111-767 - (0800) 7071-767 - 24 HOURS.
Chemical composition.	<ul style="list-style-type: none">• Ammonia gas anhydrous (NH₃), minimum = 99.5% (m/m).• Water, maximum = 0.5% (w/w).
Hazard pictograms.	
Warning words.	DANGER
Danger phrases.	<ul style="list-style-type: none">- H280: Contains gas under pressure: may explode if heated.- H330: Fatal if inhaled.- H301: Toxic if ingested.- H314: Causes severe skin burns and eye damage.- H334: When inhaled, it may cause allergic or asthma symptoms or breathing difficulties.- H341: Suspected of causing genetic defects.- H370: Causes damage to the respiratory system.- H373: May cause damage to respiratory system through prolonged or repeated exposure.- H410: Very toxic to aquatic organisms with long lasting effects

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Precautionary phrases.	<ul style="list-style-type: none">- P301 + P330 + P331: IN CASE OF INGESTION: Rinse mouth. DO NOT induce vomiting.- P303 + P361 + P353: IN CASE OF CONTACT WITH SKIN (or hair): Immediately remove all contaminated clothing. Wash the skin with water/take a shower.- P304 + P340: IN CASE OF INHALATION: Remove the person to a ventilated area and keep the person in a rest position that does not make it difficult to breathe.- P305 + P351 + P338: IN CASE OF EYES CONTACT: Rinse thoroughly with water for several minutes. If contact lenses are used, remove them if it is easy. Continue rinsing.- P308 + P311: IF exposed or suspected of exposure: Contact a TOXICOLOGICAL INFORMATION CENTER/doctor.- P342 + P311: In case of respiratory symptoms: Contact a TOXICOLOGICAL INFORMATION CENTER/doctor.- P361 + P364: Immediately remove all contaminated clothing and wash before reuse.- P377: Gas Leak with Flames: Do not extinguish unless leak can be safely contained.- P381: Eliminate all sources of ignition if it can be done safely.- P391: Collect spilled material.
Caution Phrases: Storage.	<ul style="list-style-type: none">- P403: Store in a well-ventilated place.- P410: Keep out of sunlight.

Other hazards which do not result in classification: Not known**3. - COMPOSITION AND INFORMATION ABOUT INGREDIENTS****Substance:** ANHYDROUS AMMONIA GAS (NH₃).**Chemical or common name:** AMMONIA (NH₃).Synonym: ANHYDROUS AMMONIA (NH₃).**CAS No. (Chemical Abstract Service):** 7664-41-7.**Impurities that contribute to the danger:** None.**4. - FIRST AID MEASURES****First aid measures:**

Remove victim to fresh air. If the victim is not breathing, apply artificial respiration using a mask. Call a doctor immediately. Remove contaminated clothing and shoes.

In case of contact with liquefied gas, thaw the affected part with warm water.

IMMEDIATE MEDICAL ASSISTANCE IS ESSENTIAL IN ALL CASES OF SERIOUS EXPOSURE. THE RESCUE AID TEAM MUST BE EQUIPPED WITH AUTONOMOUS BREATHING EQUIPMENT AND AWARE OF TOXICITY RISKS.

Cautious: In case of mouth-to-mouth resuscitation, there may be a chemical burn on the person providing care. Immediately forward to the nearest hospital.

Inhalation: Remove casualty to uncontaminated, ventilated area and administer oxygen, if available. Apply resuscitation maneuvers in case of cardiorespiratory arrest. Cautions: In case of mouth-to-mouth resuscitation, there may be chemical burns on the person providing care.

Immediately take the casualty to the nearest hospital.

Skin contact: Quickly remove contaminated clothing and shoes and apply a neutralizing agent (brand name Diphoterine). In cases of non-availability, wash the area with running water in abundance. Then use the neutralizer based on boric acid (5%) or boric acid (3%). Do not rub the affected area.

Eye Contact: Immediate service is essential. The first 10 seconds are critical to avoiding blindness. Apply eye neutralizing agent (trade name Diphoterine).

In cases where it is not available, wash your eyes with plenty of running water, lifting your eyelids to allow maximum removal of the product. Then use the neutralizer based on boric acid (5%) or boric acid (3%). Do not rub your eyes with your hands. After these precautions, immediately refer the victim to an ophthalmologist.

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Ingestion: Due to the physical characteristics of Ammonia, accidents due to ingestion are unlikely, however, burns may occur in the mouth, pharynx, esophagus and stomach. Never give anything by mouth to unconscious or convulsive people. Conscious and alert victims can drink water. Do not induce vomiting. If vomiting occurs spontaneously, the victim must be laid on their side to prevent pulmonary aspiration. Forward the victim to the doctor informing the characteristics of the product.

Actions to be avoided: Do not induce vomiting. Do not administer liquids to torporous, unconscious or convulsive patients. Do not give mouth-to-mouth resuscitation if the victim has inhaled or ingested the product. For these cases, use a resuscitation mask (mask).

Brief description of the main symptoms and effects: Toxic if inhaled. Causes severe skin burning with pain, blistering and skin peeling. The skin may become white or yellowish, with a waxy appearance. It causes serious eye damage with tearing, pain, eyelid edema, corneal ulceration and iris atrophy. It can lead to blindness. Contact of the liquefied gas with the eyes and skin can cause "frostbite" (frostbite). May cause allergic or asthmatic symptoms and breathing difficulties with coughing and shortness of breath. Suspected of causing genetic defects. It causes damage to the lungs with irritation, edema and hemorrhage. In high concentrations it can cause respiratory arrest, cardiac arrhythmia and death by asphyxiation. Repeated and prolonged exposure to the product can cause permanent lung damage.

Protection of the first aid provider: Adequate respiratory protection (self-contained equipment or mask with air supply) and PVC or nitrile gloves (lined).

Notes to the physician: Avoid contact with the product to help the victim. If necessary, symptomatic treatment should include, above all, supportive measures such as correction of hydroelectrolytic, metabolic disorders, as well as respiratory assistance. In case of contact with the skin and/or eyes, do not rub the affected parts.

5. - FIREFIGHTING MEASURES

Suitable extinguishing measures: Presents a moderate risk of fire. In cases of fire in installations, the best procedure is to stop the gas flow by closing the valve. Use water mist, CO₂ OR chemical powder, to extinguish the flame adjacent to the valve that controls the gas supply. Use water mist to cool fire exposed containers and shut off gas for personal protection. Water reduces the concentration of the gas due to the solubility of ammonia. For fire involving liquid ammonia, use dry chemical or CO₂ to fight it.

Inappropriate extinguishing measures: Avoid using halogenated products.

Specific hazards of the substance: Wastewater from fire control can cause pollution.

Special methods to firefighting: WARNING! Corrosive liquid and gas under pressure.

Specific hazards of chemical combustion: Presents moderate hazard when exposed to heat or flame. In the presence of oil and other combustible materials, the risk of fire increases. Under the action of heat, it can decompose releasing toxic nitrous gases (NO_x).

Firefighting team protection measures: Use personal protective equipment, especially respiratory protection. In case of fire there is a possibility of decomposition with release of toxic gases. Wear a self-contained mask or a mask with air flow, as well as PVC or nitrile (lined) clothing and gloves. Evacuate all personnel from the hazard area. Do not approach the area without a self-contained mask and protective clothing. Immediately cool containers with water jets, observing maximum distance and taking care not to extinguish flames. Remove sources of ignition if without risk. Remove all cylinders from fire area if without risk. In the meantime, continue to cool with jets of water. Let the fire burn out completely.

6. - MEASURES OF CONTROL FOR ACCIDENTAL SPILLS OR LEAKAGE

Personal precautions, protective equipment and emergency procedures.

Personnel who are not part of the emergency services: Do not breathe vapors or aerosols. Avoiding contact with the substance. Ensuring adequate ventilation. Evacuating the danger area, observe emergency procedures. If necessary, consult an expert.

Emergency service personnel: Protective equipment: "Full face" face mask with filter for acid gases in small leaks. Depending on the situation, use a "full face" face mask attached to a cylinder containing breathable air. As a complement to the information, neoprene or PVC gloves (lined internally and of the long barrel type), rubber or leather boots, trevira overalls, tyvec or, preferably, level A or B must be used.

Environmental precautions: Keep people away. Stop the leak if without risk. Avoid contact with soil and watercourses. High concentrations in the air endanger human, animal and plant life. Storage sites must have containment dikes.

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Differences in the actions of large and small leaks: For small leaks, first cordon off the area in all directions within a 100-foot radius. Next, protect people downwind within a radius of 100 meters. For large leaks, first seal off the area in all directions within a 200-foot radius. Next, protect people downwind within 600 meters during the day or 2200 meters at night.

Cleaning methods: Use individual protection equipment (specific PVC clothing and self-contained breathing apparatus or with air supply), isolate the area, remove all sources of ignition. Reduce product vapor with mist or fine water jets.

7. - HANDLING AND STORAGE**Handling:****Precautions for safe handling.**

Technical measures Ensure sufficient ventilation or local exhaust to control ambient concentration to low levels. Always use personal protective equipment (PVC clothing, neoprene gloves, boots and chemical filter mask or self-contained breathing apparatus). Prevent physical damage to tanks, cylinders, piping, etc., and isolate it from incompatible substances.

Prevention of worker's exposure: Submit the entire system to periodic maintenance control. Preventive maintenance can prevent leaks. Keep staff permanently trained.

Precautions and guidelines for safe handling: Handle containers and packages using the appropriate PPE. Make sure that the packages are identified and free of contaminants. Avoid breathing the vapor produced by the product.

Storage:**Conditions for safe storage, including any incompatibilities.**

Prevention of fire and explosion: Ammonia must be kept away from sources of ignition.

Precautions and guidelines for safe handling: To reduce the possibility of a health risk, ensure sufficient ventilation or the existence of exhaust in the room to control ambient concentration to low levels. Always use personal protective equipment.

Avoid contact with incompatible materials and environmental contaminations as mentioned in the previous fields.

Storage: Always use specified material compatible with Ammonia (pipe: Carbon steel - ASTM A 106; Tanks: Carbon Steel - normalized - ASTM A 285/A 515/A 516). Systems to be used with ammonia must first be purged with inert gas. When it is not possible to eliminate air contamination, use stainless steel.

Technical measures

Suitable conditions: The places intended for storage must be exclusively reserved for this purpose, well ventilated and clean, equipped with containment dikes, firefighting system, cooling system and abatement for leaks. Equip with safety valve system.

Recommended packaging materials: Not applicable.

Incompatible product and materials: See previous information.

Special shipping information: Cylinders must be transported in an upright position in a well-ventilated vehicle. Cylinders transported in an enclosed vehicle, in an unventilated compartment, can present serious safety risks.

8. - EXPOSURE CONTROLS AND PERSONAL PROTECTION**Specific control parameters**

Occupational exposure limits:

20 ppm / 14mg/m³ up to 48 hours a week (NR 15 - Annex 11).

TLV-TWA - 25 ppm (17 mg/ m³) (ACGIH).

TLV-STEL- 35 ppm (24 mg/ m³) (ACGIH).

Biological indicators: Blood count, platelets, arterial blood gases. See Table I of NR 7 of Ordinance 3214/78 of the Ministry of Labor and Employment.

Measures of engineering control: To reduce the possibility of potential health hazard, ensure sufficient ventilation or exhaustion is in place to control ambient concentration to low levels.

Personal Protective Equipment:

Protection for the eyes/face: Wear chemical safety glasses and/or face shields.

Protection of the skin and body: Use PVC clothes and boots.

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Hand protection: Use long-barreled PVC, neoprene, nitrile or natural latex gloves.

Respiratory protection: Panorama mask with filter for combined NH₃O. In large concentrations, use a self-contained mask (positive pressure) or a mask with supplied air.

Attention: masks with mechanical filters do not protect workers exposed to oxygen deficient atmosphere. Special precautions: Equip the area with emergency showers and eyewash stations. Never eat, drink or smoke in the work area. Practice good personal hygiene especially before eating, drinking and smoking.

Parameters of specific control:

Occupational exposure limits:

20 ppm / 14mg/m³ (LT - NR 15 - Annex 11) - ammonia

25 ppm / 17mg/m³ (LT - ACGIH) - Ammonia

Biological indicators: See table I of NR 7 of Ordinance 3214/78 of the Ministry of Labor and Employment (www.mte.gov.br)

Other limits and values: Not considered.

Appropriate Personal Protective Equipment:

Respiratory protection: Mask with filter for ammonia vapors (NH₃). In large concentrations, use self-contained masks, or air-supplied masks.

Hand protection: Use PVC gloves (long barrel).

Eye protection: Wear wide-vision safety glasses and, if possible, a face shield.

Protection of the skin and body: Use clothes suitable for the operation with chemical products, which can be increased with a trevira cover.

Special precautions: Equip the area with showers and eye wash basins. Never eat, drink or smoke in the work area. Practice good personal hygiene, especially before eating and drinking. If possible, avoid smoking. Separate contaminated clothing, ensuring that it is effectively washed before reuse. Chemical products must only be handled by trained and qualified people. All PPE's, according to NR-6, must have the CA (Certificate of Approval). Strictly follow the operational and safety procedures recommended by the organization for work. In places where chemical products are handled, monitoring of workers' exposure must be carried out, according to PPR (Environmental Risk Prevention Program) Ordinance 3.214/78 of MTB - NR-09).

Hygiene measures: Keep workplaces within hygiene standards. Periodically make employees aware of the safe handling of the product.

9. - PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquefied compressed gas.

Form: Gas.

Color: Colorless.

Odor: Characteristic odor, pungent, suffocating.

pH: Not applicable.

Melting point: -77.73°C (data from literature).

Boiling point: -33.35°C (data from literature).

Flash point: Not applicable.

Evaporation rate: Not determined.

Flammability: Not applicable.

Vapor pressure: Not applicable.

Vapor Density: 0.597 (dry air at 0 °C and 1 atm).

Density: (Gas at 21.1 °C, 1 atm): 0.71g/ml.

Solubility: In water: soluble (45.6% w/w at 25°C and 760 mmHg).

In organic solvents: soluble in methanol (29.3% w/w) and ethanol (21.0% w/w).

Partition coefficient octanol / water: Not determined.

Auto-ignition temperature: 651 °C

Decomposition temperature: above 450°C.

Viscosity: 0.00118 Pa.s at 20°C and 95%.

Other information

Molecular weight: 17 kg/kmol. Hygroscopic substance.

Although ammonia has explosive limits, it should primarily be treated as a toxic gas and should not be forgotten, however, when carrying out hot work, since it has combustibility characteristics

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at high temperatures.

10. - STABILITY AND REACTIVITY**Specific conditions:**

Chemical stability: The product is stable when stored and used under normal storage and handling conditions. Decomposes above 450 °C. No polymerization occurs.

Reactivity: Reacts with products listed below.

Possibility of hazardous reactions: The combination of ammonia and mercury is highly explosive.

Conditions to avoid: Avoid contacts with acids.

Incompatible materials: Halogens, boron, 1,2 dichloroethane, ethylene oxides, platinum, nitrogen trichloride, strong oxidizers. The product is also incompatible with acrofeine, hydrazine, potassium ferrocyanide, non-oxidizing mineral acids, sulfuric acid, nitric acid, organic acid, amide, organic anhydrides, isocyanates, vinyl acetate, oxides of alkenes (ethylene, propylene), epichlorohydrin, aldehydes, ethers, gold, copper. Also noteworthy are combinations with mercury, which are highly explosive.

Hazardous decomposition products Under the action of fire, it can decompose, releasing toxic gases.

11. - TOXICOLOGICAL INFORMATION**Information according to the different routes of exposure:**

Main symptoms: It is a strong irritant of the upper and lower respiratory system. Symptoms depend on the inhaled concentration and duration of exposure, and may cause a burning sensation, cough, labored breathing, headache, nausea and eventually fainting. Moderate vapor concentrations cause dermatitis or conjunctivitis. Higher concentrations or contact with skin and eyes cause burns and inflammation of the eyes, with possible loss of vision. Contact with skin tissue or eyes can cause cold burns.

Acute toxicity: Ammonia is toxic by inhalation. Depending on the concentration, Ammonia vapor can cause immediate irritation of the eyes, nose and throat, coughing and difficulty breathing. Exposure to high concentrations, even for short periods, can result in lung damage. Acute chemical pneumonitis may occur. Pulmonary edema can develop up to 48 hours after severe exposures.

ACGIH: LC₅₀ = 7338 ppm (lh, rat).

LD₅₀Oral = 350 mg/kg (rat).

Skin corrosion/irritation: Causes severe skin burning with pain, blistering and skin peeling. The skin may become white or yellowish, with a waxy appearance. It can cause pustules, tissue death and gangrene in more severe cases. Contact with liquefied gas can cause frostbite.

Severe ocular lesions/eye irritation: It causes serious eye damage with tearing, pain, eyelid edema, corneal ulceration and iris atrophy. It can lead to blindness. Contact with liquefied gas can cause frostbite.

Respiratory or skin sensitization: May cause allergic or asthmatic symptoms and breathing difficulties with coughing and shortness of breath. The product is not expected to cause skin sensitization.

Germ cell mutagenicity: Suspected of causing genetic defects. Positive result in in vivo micronucleus test. In blood samples from workers exposed to the substance, an increase in the incidence of chromosomal aberrations and exchange of sister chromatids was observed in the analyzed blood cells. Negative result in Ames test (Salmonella typhimurium).

Carcinogenicity: The product is not expected to be carcinogenic. Not carcinogenic according to IARC, NTP and OSHA. Not teratogenic. Non-toxic to reproduction. It has no carcinogenic effect, according to the International Agency for Research on Cancer - IARC.

Reproductive toxicity: The product is not expected to exhibit reproductive toxicity

Chronic toxicity: Repeated exposure to concentrations above the tolerance limits for occupational exposure may determine respiratory functional disorders.

Genotoxicity: In a human study of the genotoxic effects of ammonia, blood samples were analyzed from 22 workers exposed to ammonia in a fertilizer factory and 44 workers not exposed. An increase in the frequency of chromosomal aberrations, exchanges between sister chromatids and an increase in the mitotic index, proved the genotoxicity of this chemical.

12. - ECOLOGICAL INFORMATION

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Environmental effects, behaviors and impacts of the product.

Ecotoxicity: Ammonia is very soluble in water and even at low concentrations it can be harmful to aquatic life. Very toxic to aquatic life. CL50 (Rainbow trout, 96 h): 0.97 mg/L

Persistence/ degradability: The released product tends to form ammonium hydroxide (NFUOH).

Bioaccumulative potential: Plants have a high affinity for gaseous ammonia.

Mobility in soil: Ammonia is highly volatile.

Other adverse effects: Due to the corrosive nature of Ammonia, animals exposed to this product may suffer tissue damage and lead to death, depending on the environmental concentration. Plants can be adversely destroyed by dehydration from excess ammonia. Decomposition gases such as some nitrogen oxides can contribute to the formation of acid rain. High concentrations of the product can impact the aquatic environment by reducing 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 the most susceptible ones, such as children, the elderly and people with heart and lung diseases.

13. - CONSIDERATIONS ON FINAL DISPOSAL**Recommended methods for final disposal:**

The treatment and disposal of product residues must be done in a suitable environment, by people trained in the use of special equipment and the recommended PPE's to avoid contact with the product, its vapors or mists. Leaks must be contained and collected for later disposal after neutralization.

Product:

Ensure all Federal, State and local agencies receive proper notice of spills and disposal methods. CONAMA Resolution 005/1993, Law No. 12,305, as of August 2, 2010 (National Solid Waste Policy).

Product waste:

Consult environmental regulatory agencies for advice on acceptable regulatory practices. Come in contact with relevant local authorities. It can be incinerated when in compliance with local regulations. Or dispose of in an approved chemical waste landfill.

Used Package:

Empty containers must be drained and covered before handling and transport operations. If the package is not properly washed and decontaminated, it is considered to contain the product.

14. - TRANSPORT INFORMATION**National and International Regulations****Land:**

Resolution No. 5947/2021 of the Brazilian National Land Transport Agency (ANTT), Approves the Complementary Instructions to the Regulation of Land Transport of Dangerous Goods and its amendments.

UN Number: 1005

Appropriate name for shipment: ANHYDROUS AMMONIA

Risk class: 2.3

Subsidiary Risk: 8

Risk number: 268

Packing group: N.A.

Waterway:

DPC – Directorate of Ports and Coasts (Transport in Brazilian waters) Maritime Authority Regulations (NORMAM)

NORMAM 01/DPC: Vessels Used in Open-seas Navigation

UN Number: 1005

Appropriate name for shipment: ANHYDROUS AMMONIA

Risk class: 2.3

Subsidiary Risk: 8

Risk number: 268

Packing group: N.A.

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EmS: F-C, S-U

- Air Transport:

ANAC - National Civil Aviation Agency - Resolution No. 129 as of January 8, 2009

RBAC N°175 - (BRAZILIAN CIVIL AVIATION REGULATION) - TRANSPORTATION OF DANGEROUS ITEMS IN CIVIL AIRCRAFT

IS No. 175-001 - SUPPLEMENTARY INSTRUCTION - IS

ICAO - "International Civil Aviation Organization" - Doc 9284-NA/905

IATA - "International Air Transport Association"

Dangerous Goods Regulation (DGR)

UN Number: 1005

Appropriate name for shipment: ANHYDROUS AMMONIA**Risk class:** 2.3**Subsidiary Risk:** 8**Risk number:** 268**Packing group:** N.A.**15. - REGULATIONS INFORMATION**

Specific regulations for the chemical product:

Federal Decree No. 2,657, as of July 3, 1998;

Standard ABNT-NBR 14725:2014;

Ordinance No. 229, as of May 24, 2011 - Amends Regulatory Standard No. 26.

16. - OTHER INFORMATION

The information on this sheet corresponds to the current state of our knowledge and experience of the product and is not exhaustive. It applies to the product under the conditions specified, unless otherwise stated. In case of combinations or mixtures, make sure that no new danger can appear. This information does not, in any case, exempt the user of the product from complying with all legislative, regulatory and administrative texts relating to the product, safety, hygiene and protection of human and environmental health.

Bibliographical References:

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BRAZIL. MINISTRY OF LABOR AND EMPLOYMENT (MTE). Regulatory Standard (NR) No. 7: Occupational Health Medical Control Program. Brasília, DF. Jun. 1978.

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IUCLID - INTERNATIONAL UNIFORM CHEMICAL INFORMATION DATABASE. [S.I.]: European chemical Bureau. Available at: <<http://ecb.irc.ec.europa.eu>>. Access on: September, 2022



MATERIAL SAFETY DATA SHEET - MSDS

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U.S. ENVIRONMENTAL PROTECTION AGENCY. ECOSAR - Ecological Structure-Activity Relationships. Version 1.11 Available at: <http://www.epa.gov/oppt/newchems/tools/21ecosar.htm>. Access on: September, 2022