

EXTENDED PRODUCT SAFETY DATA SHEET prepared in accordance with Annex II to REACH Regulation (E) No. 1907/2006 of REACH as ammended by Regulation (EU) 2020/878

Version 6.0/EN

Date of revision: April 2023

Ammonia, anhydrous

This Safety Data Sheet contains information relating to the potential risk to people handling, transporting and handling the material, as well as information describing the potential risk to the user and the environment. The information must be available to those who would have contact with the material or are responsible for the use of the material. This Safety Data Sheet has been prepared according to the format described in the CLP Regulation (EC) No. 1272/2008.

Section 1. Name of the substance and the company/enterprise

1.1 Product identification

Chemical name:	Ammonia, anhydrous
CAS number:	7664-41-7
EINECS number:	231-635-3
Index number, CLP Annex VI, table 3.1:	007-001-00-5
Molecular formula: H ₃ N	
Molecular weight:	>=17.031 - <=17.031
REACH registration number:	01-211948876-14-0037

1.2 Related established ways of using the substances and the company / enterprise

Ammonia is used as an intermediate in the production of nitric acid, alkalis, paints, pharmaceuticals, cosmetics, vitamins, synthetic textile fibers and plastics, auxiliary agent in process and non-process substances, e.g. in photochemical processes, cooling systems, insulation products, inks and toners, coatings, thinners and paint removal chemicals, and also as a process aid in the chemical industry as a stripping agent in the reduction of nitrogen oxides, sulfur oxides, process aid in fertilizing, neutralizing agent, textile dyes, detergents and cleaning agents and in the treatment of textile fabrics. Also used in pulp/paper, leather, wood and metal surfaces, rubber/latex and semiconductor/electronics manufacturing. At the professional level, it is used as a laboratory chemical, as a cooling element in cooling systems, as a water treatment chemical, as a fertilizer, thinner or cleaning chemical for coatings and paints, and as a photochemical. It is also used as a cleaning agent, as a surface treatment product for leather and other material, a pH regulator or neutralizing agent, and as a process aid for fertilizing. Consumer uses of ammonia are in surface paints, thinners and paint removers, in filters, polishing powders and patches, in detergents and cleaners, and it is also used in cosmetics and personal care products.

1.3 Details of the supplier of the safety data sheet

Importer:

Name:	AGROPOLIHIM AD
Address:	Industrial zone 9160 Devnya
Email of the person responsible of the Safety Data Sheet:	m.tsvetkova@agropolychim.bg Engineer Miroslava Tsvetkova
Phone:	+359 / 519 97 / 526, 511

1.4 Telephones for emergency calls:

Country	Contact phone number	Specific information
Bulgaria: National Center for Prevention and Treatment of Intoxications; Pirogov Medical Institute, Sofia	+359 2 9154 233; +359 2 9154 409	Available 7 days a week, 24 hours a day
European emergency number #	112	Available 7 days a week, 24 hours a day

Section 2. Description of hazards

2.1 Classification of the substance

2.1.1 Classification of the mixture according to Regulation (EU) 1272/2008

Classification according to Regulation EC no. 1272/2008 (CLP)	Combustible gas, category 2; Gas under pressure; Acute toxicity, category 3; Corrosive to the skin, category 1B; Acute danger to the aquatic environment 1; Long-term hazard for the aquatic environment 2;	H221 H280 H331 H314 H400, M factor=1 H411
--	--	--

2.1.2 Additional Information

Physico-chemical hazards: Combustible.

Human health: Highly toxic after inhalation exposure. Causes severe burns and damage on contact with human skin. After inhalation exposure at a low concentration, coughing, irritation of the respiratory tract, eye irritation and lacrimation, discharge of secretions from the nose are caused. Inhalation at a higher concentration may cause burns of the nasopharynx and respiratory tract and bronchial and alveolar edema, dyspnea, bronchial spasm and respiratory distress may also occur. No mutagenic activity is expected. There is no evidence of carcinogenicity after exposure. Adverse reproductive effects following exposure are not typical. In a human volunteer neurotoxicity study investigating growth-related toxicity/teratogenicity, no abortion effect was observed.

Environment: Ammonia is a toxic substance for aquatic organisms.

2.2 Label Elements

According to Regulation (EU) 1272/2008

Hazard pictograms:



Signal word: DANGER

Additional hazard information: EUH071 «Corrosive to the respiratory tract»

Hazard warnings

- H221 Flammable gas.
- H280 Contains gas under pressure; may explode if heated.
- H331 Toxic if inhaled.
- H314 Causes severe skin burns and serious eye damage.
- H410 Highly toxic to aquatic organisms with a long-lasting effect.

Safety recommendations for prevention:

- P210 Keep away from heat sources/sparks/open flames/hot surfaces. Smoking prohibited.

P260	Do not breathe dust/fume/gas/vapour/spray/aerosols.
P273	Avoid release to the environment.
P280	AND use protective gloves/protective clothing/goggles/mask
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to remove. Continue rinsing.
P304+P340	IF INHALED: Move victim to fresh air and keep at rest in a position comfortable for breathing.
P301+P330+P331	IF SWALLOWED: Rinse mouth. DO NOT induce vomiting!
P377	Leaking gas fire: Do not extinguish unless the leak can be stopped safely.
P381	In case of leakage, remove all sources of ignition.
P391	Collect the spill.

2.3 Other Hazards

Persistence, bioaccumulation, toxicity (PBT):	The substance does not meet the criteria for persistence, bioaccumulation and toxicity, or strong persistence and strong bioaccumulation according to Regulation (EC) No. 1907/2006, Annex XIII
Endocrine disrupting properties	There are no data available on endocrine disrupting properties.
Presence of nanoforms	This product does not contain nanoforms or substances containing nanoforms.
Other hazards	Dyspnoea, convulsions, and cyanosis of the extremities have also been observed. Eye and nasopharyngeal irritation occurs 2-3 weeks after prolonged inhalation exposure.

Section 3. Composition

3.1 Substance

Name	CAS number:	EINECS number:	Percentage content
Anhydride, ammonia	7664-41-7	231-235-3	over 99.9%
Water			~ 0.1%

Section 4. First aid measures

4.1 Description of first aid measures

When inhaled

In the event of an inhalation accident, remove the victim to fresh air and keep him at rest. If necessary, give oxygen or perform artificial respiration. Place the casualty in a stable lateral position, cover and keep the body warm. Call a doctor immediately. Take the victim to hospital immediately.

In case of skin contact

Call a doctor immediately. Take the victim to hospital immediately. Remove contaminated clothing and shoes immediately. Wash with plenty of water. Immediately apply 2.5% calcium gluconate gel to the victim and rub it into the affected areas using rubber gloves; continue to rub the gel periodically, up to 15 minutes after the pain subsides. If the fingers/toenails are affected, even in the absence of pain, immerse them in a bath of 5% calcium gluconate for 15 - 20 min. Keep the body warm and at rest.

**After striking the eyes**

Immediate medical attention is required. Take the victim to hospital immediately. Immediately flush with plenty of water, also under the eyelids - at least for 15 minutes. Flush the eyes with a solution of 1% calcium gluconate in physiological serum (10 ml of 10% calcium gluconate in 90 ml of physiological serum). In case of difficulty lifting the eyelids, perform a pain-relieving eye wash (with oxybuprocaine).

When swallowed

Call a doctor immediately. Take the victim to hospital immediately. If the victim is conscious: - If a quantity is swallowed, rinse the mouth with water (only if the person is conscious). Give him a 1% aqueous solution of calcium gluconate to drink. DO NOT induce vomiting. Artificial respiration and/or oxygen administration may be necessary. If the victim is unconscious but breathing: If necessary, give oxygen or perform artificial respiration.

4.2 Most important symptoms and effects, both acute and delayed

No information.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment with calcium gluconate is characteristic of ammonia anhydride.

Section 5. Fire fighting measures**5.1 Fire extinguishing agents**

Use extinguishing agents that are suitable for local conditions and the surrounding environment. Suitable agents may be water jet, dry chemicals, water dust or foam.

5.2 Special hazards arising from the substance or mixture

This product is not flammable. Not easily flammable. Heating may cause release of hazardous gases. Releases hydrogen when reacting with metals. Contact with water may generate heat and there is a risk of splashing. Hazardous decomposition products include hydrogen fluoride, ammonia and nitrogen oxides.

5.3 Advice to firefighters

Wear personal respiratory protection and protective clothing. Firefighters must wear flame-resistant personal protective equipment. Wear chemical resistant outerwear.

Cool containers/reservoirs with a water jet. Avoid any possible contact with contaminated water. Approach from the windward side. Stop (extinguish) gases/vapours/mist with a water jet. After a fire, immediately clean surfaces exposed to fumes to limit equipment damage.

Section 6. Emergency Release Measures**6.1 Personal precautions, protective equipment and emergency procedures**

Approach from the windward side. Isolate the area. Wear personal respiratory protection in confined spaces, in the event of reduced oxygen levels or in the event of a significant amount of emissions. Do not allow further spillage or dispersion if it is safe to do so. Ammonia vapors can be contained with a water jet. Avoid any possible contact with contaminated water. Keep away from incompatible products.

6.2 Environmental protection measures

If the product pollutes rivers and lakes or canals, notify the appropriate authorities. Do not drain into surface water or sanitary sewer.

6.3 Method of cleaning

Absorb and place in suitable containers for disposal. Avoid raising dust. Keep in properly labeled containers. Keep in suitable, closed containers for disposal.

6.4 References to Other Sections

For more information on exposure control/personal protection or disposal issues, please check section 8 and 13 of this Safety Data Sheet.

Section 7. Processing and Storage

7.1 Precautions for safe handling

7.1.1 Precautions

Ensure good ventilation in the workplace - Comply with the European Norms for exposure in the workplace. Use only acid-resistant materials.

When emptying and draining, it is preferable to use pumping techniques.

Provide an adapted restraint system.

Use a suitable hand cart designed for carrying drums. Secure the barrels at all times during use. Use a pressure relief regulator or check valve to safely vent the gas from the barrel. Contact the supplier in case of any doubt or problem.

Use a check valve to prevent backflow into the barrel. Process small quantities in laboratory conditions. Use only in well-ventilated areas. Use only equipment and materials that are compatible with the product. Keep away from incompatible products.

7.1.2 Advice on general workplace hygiene

Do not eat, drink or smoke in workplaces.

Wash hands after work, remove contaminated clothing and protective equipment before entering dining areas.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions:

Store in cool, dry, clean, well-ventilated areas, away from alkaline products and metals. Store in a corrosion-resistant container with a resistant inner lining. Attacks many metals, producing extremely flammable hydrogen gas that can form explosive mixtures with air. Flammable vapor concentrations may accumulate in the headspace of containers. Avoid all possible sources of ignition (spark or flame). Keep containers locked. Keep them tightly closed and sealed until ready to use. Opened containers should be tightly sealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Do not stack containers on top of each other.

Do not store in direct sunlight. Do not store at temperatures close to freezing point.

Compatible storage materials:

316-L stainless steel.

High density polyethylene.

Storage class: 8B

7.3 Specific end use

No additional data. Local regulations may require specific equipment for storage or use.

Please check the identified use in section 16 and in the exposure scenario appendix of this Safety Data Sheet.

Section 8. Exposure controls / personal protective equipment

8.1 Control parameters

Anhydride, ammonia 99.9%

8.1.1 Legally regulated limit values for occupational exposure:

Workplace exposure limits:

Long-term exposure (TWA:8h) : 14 mg/m³ or 20ppm

Short-term exposure (STEL: 15min) : 36 mg/m³ or 50ppm

Workplace exposure limits for different countries:

Great Britain - TWA (8 hour reference period): 18 mg/m³.

UK - 15 min STEL: 25 mg/m³.

Bulgaria - TWA (8 hour comparison period): 14 mg/m³

Great Britain - TWA (8 hour reference period): 7 mg/m³

France - VLE (short term): 14 mg/m³

Germany - MAC: 14 mg/m³

Supposed inactive concentration (PNEC)

PNEC components

Sweetie water	0.0011 mg/l (free ammonia)
Marine water	0.0011 mg/l (free ammonia)
Voluntary discharge	0.089 mg/l (free ammonia)

8.1.2. Received inactive concentration (DNEL), after doing on evaluation on safety on the chemical substance (CSA).

Name on the substance: for the substance ammonia, anhydrous:

Conclusions on the danger to workers:

Route of exposure	Type of effect	Hazard conclusions	Most sensitive endpoint
Inhalation	Systemic effects - long-term	DNEL (Derived No Effect Level) 47.6mg/m ³	repeated dose toxicity (Oral)
Inhalation	Systemic effects - acute	DNEL (Derived No Effect Level) 47.6mg/m ³	repeated dose toxicity (Oral)
Inhalation	Local effects - long-term	another toxicological threshold 14mg/m ³	Irritation (respiratory tract)
Inhalation	Local Effects- Sharp	another toxicological threshold 36mg/m ³	irritation (respiratory tract)
Dermal	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeated dose toxicity (Oral)
Dermal	Systemic Effects - Acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeated dose toxicity (Oral)
Dermal	Local effects - Long term	medium risk (no threshold)	Skin irritation/corrosion
Dermal	Local effects - acute	medium risk (no threshold)	Skin irritation/corrosion
Eyes	Local effects	medium risk (no threshold)	

Conclusions on hazard for the general population :

Route of exposure	Type of effect	Hazard conclusions	Most sensitive endpoint
Inhalation	Systemic effects - long-term	DNEL (Derived No Effect Level) 23.8mg/m ³	Repeat-dose accuracy (Oral)
Inhalation	Systemic effects - acute	DNEL (Derived No Effect Level) 23.8mg/m ³	Repeat-dose accuracy (Oral)

Inhalation	Local effects- Long term	DNEL (Derived No Effect Level) 2.8mg/m ³	Irritation (respiratory tract)
Inhalation	Local effects- Acute	DNEL (Derived No Effect Level) 7.2mg/m ³	Irritation (respiratory tract)
Dermal	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeat-dose accuracy (Oral)
Dermal	Systemic effects - acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeat-dose accuracy (Oral)
Dermal	Local effects- Long term	medium risk (no threshold)	skin irritation/corrosion
Dermal	Local effects- Acute	medium risk (no threshold)	skin irritation/corrosion
Oral	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeat-dose accuracy (Oral)
Oral	Systemic effects - acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeat-dose accuracy (Oral)
Eyes	Local effects	medium risk (no threshold)	

8.2 Exposure Control

8.2.1 Appropriate engineering control.

Provide adequate exhaust ventilation at the workstation. The facilities should be located outdoors and not close to buildings. The integrity of indoor processes to be fully monitored. Ensure that primary emission sources are not located in the worker's breathing zone. Emergency eyewash fountains and safety showers should be available near any potential exposure.

Provide exhaust ventilation of the room. Valves, pipelines and vessels are sealed and sampling is carried out using a closed sampling loop.

8.2.2 Individual protection measures, such as personal protective equipment

Respiratory protection

- In case of dust or aerosol formation, use a respirator with an approved filter.
- Self-contained breathing apparatus in oxygen deficient environments/in large uncontrolled emissions/in all circumstances where the mask and filter do not provide adequate protection.
- Use only respiratory protection that meets international/national standards. - Use NIOSH approved respiratory protection.

Hand skin protection

- Consider the information provided by the manufacturer on permeability and penetration time and on the special conditions of the workplace (mechanical stress, duration of contact).
- Protective gloves - chemical resistant: Gloves APF 10 (90%).
- Suitable material: butyl rubber

Eye protection

Wearing eye/face protection is necessary to control the risks. The face shield or goggles must comply with EN166 or equivalent. Must be worn with respiratory protection.

Skin and body protection

- Chemically resistant apron
- If there is a possibility of splashes, wear: butyl rubber; - boots; - do not wear leather shoes.

Conclusion of danger to workers

Route of exposure	Effect type	Hazard Conclusion	Most sensitive endpoint
Inhalation	Systemic effects – Long term	DNEL (Derived No Effect Level) 47.6mg/m ³	Repeated dose toxicity (oral)
Inhalation	Systemic effects - acute	DNEL (Derived No Effect Level) 47.6mg/m ³	Repeated dose toxicity (oral)
Inhalation	Local effects - Long term	another toxicological threshold 14mg/m ³	irritation (respiratory tract)
Inhalation	Local effects - Acute	another toxicological threshold 36mg/m ³	irritation (respiratory tract)
Leather	Systemic effects - long term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeated dose toxicity (oral)
Leather	Systemic effects - acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeated dose toxicity (oral)
Leather	Local effects - Long term	medium risk (no threshold)	Skin irritation/corrosion
Leather	Local effects - Acute	medium risk (no threshold)	Skin irritation/corrosion
Eyes	Local effects	medium risk (no threshold)	

Workplace exposure limits:

8 hours exposure: 14 mg/m³ and 20ppm

Short-term exposure: 36 mg/m³ and 50ppm

Occupational exposure limits

Bulgaria - TWA (8 hour comparative period): 14 mg/m³

PNEC (fresh water): 0.0011 mg/L for free ammonia.

Conclusion of danger to the general population

Route of exposure	Effect type	Hazard Conclusion	Most sensitive endpoint
Inhalation	Systemic effects-acute	DNEL (Derived No Effect Level) 23.8mg/m ³	Repeated dose toxicity (oral)
Inhalation	Local effects - long term	DNEL (Derived No Effect Level) 2.8mg/m ³	irritation (respiratory tract)
Inhalation	Local effects - acute	DNEL (Derived No Effect Level) 7.2mg/m ³	irritation (respiratory tract)
Leather	Systemic effects - acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeated dose toxicity (oral)
Leather	Local effects - long term	medium risk (no threshold)	Skin irritation/corrosion
Leather	Local effects - acute	medium risk (no threshold)	Skin irritation/corrosion
Orally	Systemic effects - long term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeated dose toxicity (oral)
Orally	Systemic effects - acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Repeated dose toxicity (oral)
Eyes	Local effects	medium risk (no threshold)	

8.2 Exposure Control

8.2.1 Appropriate engineering control.

Provide adequate exhaust ventilation at facilities. Use technical means to comply with occupational exposure limits. Use only in areas equipped with showers. Remove contaminated clothing and shoes immediately. Wash contaminated clothing before reuse. Handle in accordance with good industrial hygiene and safe practice. Provide exhaust ventilation of the room. Valves, pipelines and vessels are sealed and sampling is carried out using a closed sampling loop.

8.2.2 Individual protection measures, such as personal protective equipment

Means for the protection of the respiratory tract

- In case of dust or aerosol formation, use a respirator with an approved filter.
- Self-contained breathing apparatus in oxygen deficient environments/in large uncontrolled emissions/in all circumstances where the mask and filter do not provide adequate protection.
- Use only respiratory protection that meets international/national standards. - Use NIOSH approved respiratory protection.

Hand protection



- Take into account the information provided by the manufacturer on permeability and penetration time and on the special conditions of the workplace (mechanical stress, duration of contact).
- Protective gloves - chemical resistant: Gloves APF 10 (90%).
- Suitable material: butyl rubber

Eye protection

Wearing eye/face protection is necessary to control the risks. The face shield or goggles must comply with EN166 or equivalent. Must be worn with respiratory protection.

Skin protection

- Chemically resistant apron
- If there is a possibility of splashes, wear: butyl rubber; - boots; - do not wear leather shoes.

8.2.3 Environmental exposure control**8.2.3.1 Industrial use**

Avoid uncontrolled discharge of ammonia water solutions into municipal sewers or surface water. In the event of such a release, it could cause a significant change in the pH of the waters. A periodic check of the pH value is required when discharging into open water sources. General drainage should be done to minimize pH changes in the receiving surface water.

8.2.3.2 Professional Use

Do not allow uncontrolled discharge of large flows of ammonia solutions into municipal sewers or surface water sources.

Section 9. Physical and chemical properties

Appearance:	colorless gas
Smell:	characteristic, sharp, suffocating
Odor threshold:	0.6-53ppm found using geometric means 17ppm.
pH:	Not applicable
pKa:	No data
Melting/Freezing Point:	-77.7°C
Boiling point:	-33°C
Flash point:	Not applicable
Evaporation rate:	Not applicable
Flammability:	Combustible
Top/bottom border on flammability or explosion:	Flammability of ammonia vapors in air volume percentages 16-26 (at atmospheric pressure and temperature).
Vapour pressure:	8611 hPa.
Vapour Density:	0.59

Relative density:	Not applicable
Solubility:	Highly soluble in water, approximately 48200 mg/L.
Partition coefficient n- octanol/water:	Not applicable (inorganic substance)
Auto-ignition temperature:	651°C (ammonia money)
Decomposition temperature:	Not applicable (inorganic substance)
Viscosity:	Not applicable
Oxidizing properties:	not oxidizing
Explosive properties:	It is not explosive

9.2 Additional Information

Miscible with water in any proportion

Section 10. Stability and reactivity

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical stability

Stable under suitable conditions.

10.3 Probability of hazardous reactions

It can form unstable or explosive compounds with halogens, nitric acid, hypochlorites, silver, mercury, lead. May react violently in contact with strong acids, nitrogen oxides.

10.4 Conditions to Avoid

Heat, direct light and mechanical damage to the container. Halogens, nitric acid, hypochlorites, silver, mercury, lead, strong acids and nitrogen oxides.

10.5 Incompatible Materials

Acids, strong oxidants, halogen elements, acrylic acid, dimethyl sulfate, silver nitrate, silver oxide, hypochlorite, mercury, etc.

10.6 Hazardous decomposition products

Hydrogen, nitrogen oxides.

Section 11. Toxicological information

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

Acute toxicity: Very toxic by inhalation. Anhydrous ammonia is a gas, so testing for acute oral toxicity is technically infeasible. The substance is corrosive and is classified accordingly: exemptions are therefore offered for acute oral and dermal toxicity. A number of non-standard acute inhalation toxicity studies in rats and mice have shown that the substance is toxic by inhalation. A key LC50 value of 9850 mg/m³/ air was retained in rats exposed for 60 minutes.

	Impact dose	Biological species	Method	Note
--	-------------	--------------------	--------	------

Acute oral toxicity	LD50 350 mg/kg live weight	Male white rats	Severe oral toxicity	Analysis actually performed
Acute dermal toxicity	LD50			Refused due to the toxicity of the substance.
Acute inhalation toxicity	LC50 28130 - 13770 mg/m ³	Male and female white rats	Evaluation of acute inhalation toxicity in rats after different exposure periods.	The results are in the exposure range from 10 min to 60 min.

Skin corrosion/irritation : Causes severe burns to human skin. Skin irritation testing is not required because contact with ammonia causes direct skin corrosion.

Serious eye damage/irritation: Causes severe eye irritation. No study has been performed, but based on the skin irritation results, it can be assumed that there will be eye irritation.

Respiratory or skin sensitization: No information available. Due to its corrosiveness, sensitization testing is not required.

	Exposure time	Biological species	Assessment	Method	Note
Initial skin irritation:	there is no	Person	Corrosive	there is no	A skin pH of 10 was determined.
Eye irritation	there is no	there is no	Very annoying	there is no	No study has been performed, but based on the skin irritation results, it can be assumed that there will be eye irritation.

Germ cell mutagenicity : No indications of mutagenicity after testing *in vitro* Bacterial Reverse Mutation method and *in vivo* Micronucleus method.

Carcinogenicity: According to Regulation EC No. 1272/2010 (EU CLP), ammonia does not meet the criteria for classification as "carcinogenic to humans" for the following reasons:

- There are no human studies on ammonia that establish a causal relationship between exposure and the development of cancer. As such, classification as Category 1A is not guaranteed.
- There are no animal experiments that show evidence that ammonia is a carcinogen. Therefore, classification as category 1B is not supported by the data set.

Reproductive toxicity/developmental toxicity: No indication of toxicity affecting reproduction.

STO (specific toxicity to certain organs) — single exposure/repeated exposure :

STOO	Impact dose	Value	Duration of exposure	Biological species	Method	Assessment
Medium strong in the mouth	68 mg/kg bw/d	NOAEL	35 days	Crj: CD(SD) male and female rats	Combined repeat dose toxicity study and reproductive/growth toxicity study	No pronounced toxicity
Medium chronic by inhalation	LC50 35 - 63 mg/m ³	NOAE C	50 days	Male white rats	Moderate chronic inhalation toxicity of ammonia in the rat.	There is no systemic toxicity, but the initial effect is local irritation of the respiratory tract.

Route of exposure: Inhalation and oral .

11.2 Information on other toxicological hazards

See section 12, point 12.6 of the data sheet. No other information available.

Section 12. Environmental Information

12.1 Toxicity

Ammonia is toxic to aquatic organisms.

Toxicity to aquatic organisms	Dose of impact	Exposure time	Biological species	Method	Assessment	Note
Strong toxicity to fish	LC50	96 h	<i>Rainbow trout (Onchorynchus mykiss)</i>		0.89 mg/L non-ionized ammonia.	The result is pH and temperature regulation.
Strong toxicity to daphnia	EC50	48 h	<i>Daphnia magna (Daphnia magna)</i>	Freshwater, static, conforming to ASTM E729-80.	101 mg/L	Results, based on mortality.
Strong toxicity to algae	EC50	18 days	<i>Chlorella vulgaris (Chlorella vulgaris)</i>	Freshwater, static	7200 mg/L	Score based on number of cells
Chronic toxicity to fish	LOEC	73 days	<i>Rainbow trout (Onchorynchus mykiss)</i>		0.022 mg/L	Score, based on mortality
Chronic toxicity to daphnia	NOEC	96 h	<i>Daphnia magna (Daphnia magna)</i>	Freshwater Stream - Equal or Similar to EPA OPPTS 850.1300 (Chronic Toxicity Test to Daphnia)	0.79 mg/L non-ionized ammonia.	Score, based on mortality.

12.2 Persistence and degradability

Not considered persistent and rapidly degradable in aquatic systems. In abiotic environments, ammonia is taken up by algae and macrophytes for use as a nitrogen source.

12.3 Bioaccumulative potential

Ammonia accumulation in flora and fauna is not considered significant in the environment because it does not accumulate in lipid-rich tissues in the same way as organic matter. Ammonia is found everywhere in aquatic environments due to the decomposition of plants and animals and the excretory process of animals. As ammonia is a product of normal metabolism, it is not expected to be bioaccumulative.

12.4 Mobility in soil

Limited mobility in soil is expected due to strong adsorption of ammonium ions by clay minerals and bacterial oxidation to nitrate. Ammonia in the soil is in dynamic equilibrium with nitrate and other substances in the nitrate cycle.

12.5 Results of the assessment of persistence, bioaccumulation and toxicity and high persistence and strong bioaccumulation

The substance has not been identified as persistent, bioaccumulative and toxic (PBT).

12.6 Properties disrupting the functions of the endocrine system.

No data available on endocrine disrupting properties.

12.7 Other adverse effects

No additional information

Section 13. Waste treatment

13.1 Waste treatment methods

Defuse in compliance with all applicable local and national regulations.

Disposal methods: Empty packages may contain vapor, do not cut, grind or weld. Use only authorized companies for transport, as well as for recycling or disposal of waste. The latter should be treated as hazardous waste. Comply with all applicable local and national laws.

Information on waste treatment: Packaging waste should be collected and stored separately in precisely defined and designated places, until it is handed over to authorized companies for treatment.

Disposal information in the sewage system: Contaminated water should not be disposed of by discharge into the sewage system, water sources, soil or groundwater.

Please follow all local, municipal, national, and international laws.

Section 14. Shipping Information

Ground transportation UN RTDG/ADR/RID:

14.1 UN List Number or Identification Number

International regulations

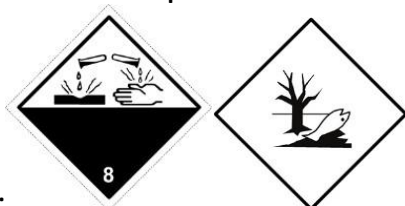
UN No: 1005

14.2 Exact name of the shipment on the UN list:

ADR / RID: AMMONIA, ANHYDRIDE

14.3 Transport hazard classes

ADR/RID: Land transport



Label:

Class: 2.3

14.4 Packing group: not applicable

14.5 Environmental hazards:

Classification code: C5

Environmentally hazardous substances

Identification number: 80

14.6 Special protective measures for consumers

The person transporting the product must be trained and know how to respond in the event of an accident or ammonia leak.

14.7 Sea transport of cargoes in bulk according to instruments of the International Maritime Organization (according to Annex II of MARPOL 73/78 and the IBC-Code): Not applicable

Section 15. Information according to the current regulations

15.1 Safety, health, and environmental regulations/legislation specific for the substance or mixture EC Regulation 1907/2006 (REACH); Regulation EC 1272/2008 (CLP) ; Regulation (EU) 2020/878

Ordinance on the order and method of storage of dangerous chemicals and mixtures, 05.02.2021

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out. See Appendix for exposure scenarios.

Section 16. Other Information

16.1 Hazard warnings

The full texts of each classification used in sections 2.1 and 3 Classification according to Regulation 1272/2008 (CLP) :

Hazard statements used in Section 3

- H221 Flammable gas.
- H280 Contains gas under pressure; may explode if heated.
- H331 Toxic if inhaled.
- H314 Causes severe skin burns and eye damage.
- H400 Acute danger to the aquatic environment.
- H411 Long-term hazard for the aquatic environment.

16.2 Other hazards:

Not considered PBT or vPvB

16.3 Other information: Provide adequate information, instructions and training to operators. Carry out regular training for all employees in the field of transport (according to ADR, chapter 1.3).

16.4 Revision: The current version of the SDS has been completely updated.

Version:	06
Date of preparation:	April, 2023
Previous version:	05/ June, 2020
Publisher Information:	This version supersedes all previous documents
Prepared / Revised by:	"Agropolychim" JSC, Production Directorate

16.5 Abbreviations:



ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS: Chemical Abstracts Service
EC: European Community
EN: European standard
ERC: Environmental Release Category
EU: European Union
EUH: European Hazard Statement
GHS: Globally Harmonized System
LC50: Medium Lethal Dose
DNEL: Predicted No Effect Exposure Level
NOAEC/NOAEL: No Observed Adverse Effect Concentration/Level
OECD: Organization for Economic Co-operation and Development
PBT: Persistence, bioaccumulation, toxicity
vPvB: High persistence and strong bioaccumulation
P TFE : Polytetrafluoroethylene
PNEC: Predicted No Effect Exposure Concentration
PVC: Polyvinyl Chloride
STEL: Short Term Exposure Limit

Note: The above information according to the current regulations only indicates the principle regulatory documents applicable specifically to the product described in the Safety Data Sheet. The user's attention is drawn to the possible existence of additional decrees that supplement these normative documents. Comply with all applicable national, international and local regulations or ordinances.