EXTENDED SAFETY DATA SHEET prepared in accordance with Annex II to REACH Regulation (F) No 1907/2006 as amended by Regulation (EU) 2020/878

Version 7.0/BG Revision Date: June 2026

Ammonia, anhydrous

I7 Changes made to this edition.

This Safety Data Sheet contains information relating to the potential risk to people involved in the handling, transport and handling of Ammonia, Anhydride, as well as information describing the potential risk to the user and the environment. The information must be accessible to those who have contact with the material or who are responsible for the use of the material. This Safety Data Sheet has been prepared in accordance with the format described in Regulation CLP (EC) No 1272/2008 and any subsequent amendments.

Section 1. Identification of the substance/mixture and the company/enterprise

1.1 Product Identification

Product Name:	Ammonia, anhydrous
Other names:	Liquid ammonia
CAS Number:	7664-41-7
EINECS number:	231-635-3
Index number, CLP Annex VI, table 3.1:	007-001-00-5
Molecular Formula: H3N	
Molecular weight:	>=17.031 - <=17.031
REACH registration number:	**01-2119488876-14-0037**

1.2 Identified uses of the substance or mixture that are relevant and uses not recommended

Industrial and professional use – intermediate product; distribution; formulation; refrigerant.
Consumer use: As ammonia water, diluted, cleaning products.
Uses not recommended: See section 16.

1.3 Data sheet provider details

Submitted by:

Name:	AGROPOLYCHIM AD
Address:	Industrial zone 9160 g. Devnya
URL website:	www.agropolychim.bg
Email:	m.tsvetkova@agropolychim.bg
Tel.:	+359 / 519 97 411

1.4 Emergency Phone Number:

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

Section 2. Identification of hazards

2.1 Substance classification

2.1.1 Classification of the mixture according to Regulation (EC) 1272/2008 and its amendments.

Classification according to Regulation EC No. 1272/2008 (CLP)	Flammable gas, category 2; (Flam. Gas 2) Pressurized gas (liquefied gas); (Liq. Gas) Acute toxicity (inhalation), category 3; (Acute Tox 3) Corrosion, skin irritation, category 1B; (Skin Corr. 1B) Acute danger to the aquatic environment, category 1; (Aquatic Acute 1) Chronic hazard to the aquatic environment, category 2; (Aquatic Chronic 2)	H221 H280 H331 H314 H400, M f-r = 1 H411

2.1.2 Additional information

Physical and chemical hazards: Flammable.

Health hazards:

Inhalation: Toxic by inhalation. Exposure to low concentrations of inhalation leads to respiratory irritation, coughing, eye inflammation and lacrimation, wet nose and nasal discharge. At higher concentrations, it can cause burns to the nose, throat and respiratory tract, as well as bronchiolar and alveolar edema, dyspnea, bronchospasm and respiratory distress.

On skin contact: Splashes with liquid ammonia cause skin burns. Vapors in the presence of moisture are irritating to the skin.

In contact with the eyes: Splashes with liquid ammonia lead to long-term eye damage, with a final effect of up to several days. The vapors cause irritation and watery eyes and, at high concentrations, can cause damage.

No mutagenic action was observed. There is no evidence of carcinogenicity after exposure. Don't observe unwanted reproductive impacts and does not cause miscarriage.

Environment: It is defined as a toxic substance for aquatic organisms.

2.2 Label elements

Pursuant to Regulation (EC) 1272/2008

Hazard pictograms:

GHS06 **GHS04** **GHS09** **GHS04**

Signal word: DANGER

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

Hazard warnings:

H221 Flammable gas.
H280 Contains pressurized gas; It can explode if it gets hot.
H331 Toxic by inhalation.
H314 It causes severe skin burns and serious eye damage.
H410 Highly toxic to aquatic organisms with a long-lasting effect.

Safety recommendations for prevention:

R210 Keep away from heat sources, sparks, open flames, hot surfaces and other sources of ignition. Smoking is prohibited.

R260 Do not inhale gas, fumes or aerosols.

R273 Avoid discharge into the environment.

P280 Use protective gloves for chemical protection, protective clothing, protective mask for the whole face with a seal filter.

P303+P361+P353 IN CASE OF SKIN (or hair): Remove all contaminated clothing immediately. Rinse the skin with water/take a shower.

P305+P351+P338 EYE CONTACT: Rinse gently with water for several minutes. Remove contact lenses, if any, and they are easy to remove. Continue rinsing.

P304+P340 ON INHALATION: Move the victim to fresh air and allow him to rest in a breathing position.

P301+P330+P331 ON INGESTION: Rinse your mouth. DO NOT INDUCE VOMITING!

P377 Leakage Gas Fire: Do not extinguish unless the leak can be stopped safely.

P381 In the event of a leak, remove all ignition sources.

2.3 Other dangers

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

Section 3. Ingredients / Ingredient Information

3.1 Substance

Name	CAS Number:	EINECS number:	Index No. in Annex VI CLP:	Percentage content	M - coefficient
Anhydride, anhydrous	7664-41-7	231-235-3	007-001-00-5	over 99.9%	M=1(Aquatic acute)

Section 4. First aid measures

4.1 Description of first aid measures *I7*

General comments:

In case of unconsciousness, the victim is placed in a stable lateral position. Providing a shower and an eye wash area near the work site. Speed to respond is essential.

After inhalation

In the event of an inhalation accident, take the victim to fresh air and leave him alone. If necessary, but only if you are trained for it, give oxygen or do artificial respiration. Place the victim lying down in a stable lateral position, cover and keep the body warm. Seek medical attention immediately.

After skin contact
Remove contaminated clothing and shoes immediately. Wash off with plenty of water, at least for a period of 15 minutes. Seek medical attention. The patient should be examined in a healthcare facility if irritation or pain persists.
After cold frost (from the evaporating liquid)
In case of cold burns, clothes can stick to the skin. Defrost them gently with a sufficient amount of warm water. Remove clothes and wash the affected parts.
After eye damage
Immediately rinse the eyes with a generous amount of lukewarm water for at least 15 minutes. Remove contact lenses, if any, and as far as possible. If irritation, pain, swelling, excessive tearing, or sensitivity to light persist, see an ophthalmologist immediately.
After ingestion
Unlikely route of impact. Seek medical attention immediately. If the victim is conscious, rinse the mouth immediately and give drinking water. Do not induce vomiting!

4.2 Most significant acute symptoms and effects that occur after a certain period
Acute reactions: Causes suffocation, severe coughing fits, eye pain, redness of the skin with the appearance of red spots and blisters, dizziness, stomach pain and vomiting.
Delayed reactions: Pulmonary edema can occur within 48 hours and can be fatal depending on the concentration and duration of exposure.

4.3 Indication of the need for any emergency medical care and special treatment
Rapid termination of contact with ammonia. Respiratory resuscitation with oxygen jet, if necessary - tracheotomy and assisted breathing - only by trained personnel! Symptomatic treatment – antitussive drugs, analgesics, etc. Seek medical attention and consultation with a Toxicology Center.

Section 5. Fire extinguishing measures

5.1 Fire extinguishing means
Use fire extinguishing agents that are suitable for local conditions and the environment. **Suitable means** can be water mist *I12*, dry chemicals, carbon dioxide *I12* or foam.
Inappropriate means: Water jet.

5.2 Particular hazards arising from the substance or mixture *I12*
Exposure to fire may cause the storage container to burst or explode.
Hazardous combustion products: Under the influence of thermal degradation fire, the following toxic and/or corrosive substances can be formed: nitrogen monoxide / nitrogen dioxide.
Explosive when mixed with air at concentration limits of 16÷25 vol. Hydrogen is released when reacting with metals. Contact with water leads to the release of heat and there is a danger of splashing.

5.3 Tips for firefighters *I12*
If this is possible, stop the flow of gas first - it is usually the best procedure to follow when the leaking gas burns. Do not allow water to get into the dishes.
Move the pot out of the fire zone if you can do so without risk.
Pour cooling water over the walls of the vessel that are exposed to flames until the fire goes out. Stay away from the edges of dishes due to a possible explosion when dishes are involved in a fire. Re-spontaneous/explosive ignition is possible. To extinguish any other fire.
Insulate the area until the gas is dispersed.
Use water spray or foam to control vapors Use an autonomous breathing apparatus when vapors and/or vapours are likely to be inhaled.
Wear chemical protective clothing that is safe for use in ammonia involved in a fire.

Section 6. Emergency release measures

6.1 Personal Protective Equipment, Protective Equipment, and Emergency Procedures
Approach from the windward side. Isolate the area and prohibit entry/access. Wear personal respiratory protective equipment in confined spaces, in cases of low oxygen levels or in case of significant amounts of emissions. Fully encapsulated, vapor protective clothing should be worn in case of spills and leaks without fire. Use water spray or foam to control fumes. **Mixing water and liquid ammonia will increase the evaporation rate. Do not pour water over liquid ammonia unless more than 100 volumes of water are available for each volume of liquid ammonia.**
- **For personnel not responsible for emergencies:** Use personal protective equipment (PPE) - Use chemical protection gloves, a full-faced protective mask with a gas filter and protective clothing.
- **For personnel responsible for emergencies:** Fireproof personal protective equipment, gloves, boots and autonomous breathing apparatus.

6.2 Environmental protection measures
If the product contaminates rivers and lakes or the sewer network, notify the relevant authorities. Do not drain into surface water or into sanitary sewer**.**

6.3 Containment and cleaning methods and materials
Dilute small spills with water. Neutralize large spills with a suitable chemical, for example, monoammonium phosphate. Collect and store waste in appropriately closed containers labelled in accordance with regulatory requirements. Hand over waste to authorized disposal companies.

6.4 References to other sections
For more information on issues related to exposure control/personal protection or disposal, please check Sections 8 and 13 of this Safety Data Sheet.

Section 7. Operation and storage

7.1 Precautions for safe operation
7.1.1 Precautions *I12*
Use appropriate personal protective equipment when working with or around ammonia.
Skin protection is necessary when exposed to liquid, mist and gas or steam. Neoprene or rubber type of gloves, ammonia-resistant clothing (overalls, jacket and boots), as required.
Use goggles to protect against chemical hazards when there is a possibility of contact with liquid or mist. A full-face shield is recommended in addition to goggles for added protection.
There should be a safety shower and an eyewash fountain in the ammonia handling area.
Use special containers - do not rinse
Keep away from heat, ignition sources, and incompatible materials (See section 10). Take preliminary measures against static discharge.
Ensure adequate ventilation. When working with small quantities, use a fireplace.
Avoid skin and eye contact, as well as inhalation of vapors.
Wear full protective clothing where there is a risk of leakage/splashing.
Do not eat, drink or smoke while operating the product.
7.1.2 Advice on general hygiene at work
Do not eat, drink or smoke in workplaces.
Wash your hands after work, remove contaminated clothing and protective equipment before entering the dining room.

7.2 Safe storage conditions, including any incompatibilities

Technical measures and storage conditions, incompatibility:
Store containers tightly closed, in a cool, well-ventilated place.
Follow the relevant industry or national regulations for storing large quantities and storing them in a container (bottle).
Packaging materials:
Suitable: Steel (Low Carbon), Steel (Stainless 18% Cr, 8% Ni), Steel (Stainless Molybdenum), Aluminum Bronze
Unsuitable: nickel (cast), cast iron (foundry)
Storage class: 2A

7.3 Specific final consumption
There is no additional data. Local ordinances may require specific equipment for storage or use.

Section 8. Exposure control / personal protective equipment

8.1 Control parameters
Ammonia, anhydrous: 99.9%

8.1.1 Statutory limit values for occupational exposure:
Occupational exposure limits:
Long-term exposure (TWA:8h): 14 mg/m3 or 20ppm
Short-term exposure (STEL: 15min): 36 mg/m3 or 50ppm
Occupational exposure limits in different countries:
UK – TWA (8 hour comparison period): 18 mg/m3.
Great Britain – 15 min. STEL: 25 mg/m3.
Bulgaria - TWA (8 hours comparison period): 14 mg/m3
UK – TWA (8 hours comparison period): 7 mg/m3
France - VLE (short-term): 14 mg/m3
Germany - MAC: 14 mg/m3
Suspected Inactive Concentration (PNEC)

Components	PNEC
Fresh water	0.0011 mg/l (free ammonia)
Sea water	0.0011 mg/l (free ammonia)
Salvo Release	0.089 mg/l (free ammonia)

8.1.2. Obtained Inactive Concentration (DNEL) following a chemical safety assessment (CSA).

Substance name: Ammonia, anhydrous.

Conclusions on the danger to workers:

Exposure Path	Type of effect	Hazard conclusions	Most sensitive endpoint
Inhalation	Systemic effects - long-term	DNEL (Derived No Effect Level) 47.6mg/m³	multiple-dose toxicity (Oral)
Inhalation	Systemic Effects- Acute	DNEL (Derived No Effect Level) 47.6mg/m³	multiple-dose toxicity (Oral)
Inhalation	Local effects - long-term	other toxicological threshold 14mg/m³	Irritation (respiratory tract)
Inhalation	Local Effects- Acute	other toxicological threshold	irritation (respiratory tract)

		36mg/m³	
Dermal	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple dose toxicity (Oral)
Dermal	System Effects- Acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple dose toxicity (Oral)
Dermal	Local effects - Long-term	medium risk (no defined threshold)	Skin irritation/corrosion
Dermal	Local effects- acute	medium risk (no defined threshold)	Skin irritation/corrosion
Eyes	Local effects	medium risk (no defined threshold)	

Hazard conclusions for the general population:

Exposure Path	Type of effect	Hazard conclusions	Most sensitive endpoint
Inhalation	Systemic effects - long-term	DNEL (Derived No Effect Level) 23.8mg/m³	Multiple-dose accuracy (Oral)
Inhalation	Systemic Effects- Acute	DNEL (Derived No Effect Level) 23.8mg/m³	Multiple-dose accuracy (Oral)
Inhalation	Local effects - Long-term	DNEL (Derived No Effect Level) 2.8mg/m³	Irritation (respiratory tract)
Inhalation	Local Effects- Acute	DNEL (Derived No Effect Level) 7.2mg/m³	Irritation (respiratory tract)
Dermal	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple-dose accuracy (Oral)
Dermal	Systemic Effects- Acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple-dose accuracy (Oral)
Dermal	Local effects - Long-term	medium risk (no defined threshold)	Skin irritation / corrosion
Dermal	Local Effects- Acute	medium risk (no defined threshold)	Skin irritation / corrosion
Oral	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple-dose accuracy (Oral)

Oral	Systemic Effects-Acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple-dose accuracy (Oral)
Eyes	Local effects	medium risk (no defined threshold)	

8.2 Exposure control

8.2.1 Appropriate engineering control.

Ensure adequate exhaust ventilation of the workstation. The facilities should be located outdoors and not close to buildings. The integrity of indoor processes should be fully monitored. Make sure that the primary emission sources are not located in the worker's respiratory area. In the immediate vicinity of any potential exposure, there should be emergency eye washing fountains and safety showers.

Provide suction ventilation of the room. Valves, pipelines and vessels should be sealed and sampling should be carried out by means of a closed sampling loop.

8.2.2 Individual protective measures, such as personal protective equipment

Respiratory protection

- In case of aerosols or ammonia fumes, use a full-face mask with a checked and approved filter.
- Autonomous breathing apparatus in an environment with insufficient oxygen / with high 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 EU-approved respiratory protection.

Protection of the skin of the hands

When working with anhydrous ammonia, wear gloves for chemical protection in accordance with EN 374, including: material - nitrile, non-oprene, minimum impregnation time - ≥ 480 minutes. Seepage resistance class - 6 mm. Please follow the supplier's instructions regarding the conditions of use and shelf life.

Eye protection

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

Protection of skin and body

- Chemically resistant apron. Long-sleeved protective clothing and safety shoes.
- If there is a possibility of splashing, wear: bottle rubber; - boots; - Do not wear leather shoes.

Thermal hazards: Use appropriate thermal protective clothing.

Conclusion on danger to workers

Exposure Path	Type of effect	Conclusion on danger	Most sensitive endpoint
Inhalation	Systemic effects – Long-term	DNEL (Derived No Effect Level) 47.6mg/m³	Multiple dose toxicity (oral)
Inhalation	Systemic Effects-Acute	DNEL (Derived No Effect Level) 47.6mg/m³	Multiple dose toxicity (oral)
Inhalation	Local effects - Long-term	other toxicological threshold 14mg/m³	Irritation (respiratory tract)

Inhalation	Local Effects- Acute	other toxicological threshold 36mg/m³	Irritation (respiratory tract)
Skin	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple dose toxicity (oral)
Skin	Systemic Effects- Acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple dose toxicity (oral)
Skin	Local effects - Long-term	medium risk (no defined threshold)	Skin irritation/corrosion
Skin	Local Effects- Acute	medium risk (no defined threshold)	Skin irritation/corrosion
Eyes	Local effects	medium risk (no defined threshold)	

Occupational exposure limits:
8 hours of exposure: 14 mg/m^3 and 20ppm
Short-term exposure: 36 mg/m^3 and 50ppm
Exposure limits in the workplace
Bulgaria - TWA (8 hours comparison period): 14 mg/m^3
PNEC (fresh water): 0.0011 mg/L for free ammonia.

Conclusion on danger to the general population

Exposure Path	Type of effect	Conclusion on danger	Most sensitive endpoint
Inhalation	Systemic effects- sharp	DNEL (Derived No Effect Level) 23.8mg/m³	Multiple dose toxicity (oral)
Inhalation	Local effects – long-term	DNEL (Derived No Effect Level) 2.8mg/m³	irritation (respiratory tract)
Inhalation	Local effects- acute	DNEL (Derived No Effect Level) 7.2mg/m³	irritation (respiratory tract)
Skin	Systemic Effects- Acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple dose toxicity (oral)
Skin	Local effects - long-term	medium risk (no defined threshold)	Skin irritation/corrosion
Skin	Local effects- acute	medium risk (no defined threshold)	Skin irritation/corrosion
Oral	Systemic effects - long-term	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple dose toxicity (oral)

Oral	Systemic Effects-Acute	DNEL (Derived No Effect Level) 6.8mg/kg bw/day	Multiple dose toxicity (oral)
Eyes	Local effects	medium risk (no defined threshold)	

8.2.3 Environmental Exposure Control
See the attached exposure scenarios.

8.2.3.1 Industrial use
Avoid uncontrolled discharge of ammonia solutions into city sewers or into surface water. In the event of such discharge, it could cause a significant change in the pH of the waters. Periodic check of the pH value of leakage into open water sources is necessary. In the case of general drainage, it should be done so that changes in the pH in the receiving surface water are minimized.

8.2.3.2 Professional use
Do not allow uncontrolled discharge of large streams of ammonia solutions into the city sewer system or into above-ground water sources.

Section 9. Physical and chemical properties

9.1 Physical and chemical properties: *I7*

State of aggregation:	Gaseous at 20°C and 101.3 kPa
Smell:	characteristic, pungent, suffocating
Odor limit:	0.6-53ppm, detected using 17ppm geometric means.
pH:	Not applicable, gas,
pKa:	No data
Freezing point:	-77,7°C
Boiling point:	-33°C
Evaporation Rate:	Not applicable
Flammability:	Flammable gas
Upper/lower flammability limit	Flammability of ammonia vapor in air by volume 16-25 (at atmospheric pressure and temperature).
Vapor pressure:	8611 hPa at 20^{0C}
Density:	0.708 kg/m³ at 20°C
Relative density:	0.588 at 20°C (air density 1.205 kg/m³)

Solubility:	Highly soluble in water, approximately 48200 - 53100 mg/L at 25^{0C}.
N-octanol/water partition coefficient:	log Kow: 0.23 at 20°C
Self-ignition temperature:	651°C (ammonia vapour)
Decomposition temperature:	Not applicable (inorganic substance)
Kinematic viscosity:	Not applicable
9.2 Other information	
Oxidizing properties:	Anhydrous ammonia is not assumed to be an oxidizing agent based on a theoretical assessment of its chemical structure
Explosive properties:	Anhydrous ammonia is not assumed to be explosive based on a theoretical assessment of its chemical structure
Flammability:	Flammable gas, hazard category 2
Pressurized gases:	Liquefied gas.
Critical temperature:	132 ^{0C}
Critical pressure:	113,0 hPa

Section 10. Stability and reactivity

10.1 Reactivity
Stable under normal conditions, see section 7.

10.2 Chemical stability
Stable in operation and storage in accordance with applicable regulations.

10.3 Probability of dangerous reactions *I7*
When heated above 454°C, hydrogen is released. The decomposition temperature can be lowered to 300°C by contact with certain metals such as nickel. At 690°C or in the presence of an electric spark, ammonia decomposes into nitrogen and hydrogen, which can form a flammable mixture in the air.
Ammonia has potentially explosive or violent reactions with interhalogens, strong oxidizing agents, nitric acid, fluorine, and nitrous oxide. Ammonia forms sensitive explosive mixtures with air and hydrocarbons, ethanol and silver nitrate and chlorine. Explosive products are formed when ammonia reacts with silver chloride, silver oxide, bromine, iodine, gold, mercury and tellurium halides.

10.4 Conditions to be avoided

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 products resulting from decay
Hydrogen, nitrogen oxides (during combustion).

Section 11. Toxicological information

11.1 Information on hazard classes defined in Regulation (EC) No 1272/2008
Acute toxicity: Highly toxic by inhalation. Anhydrous ammonia is a gas, which is why oral acute toxicity testing is technically not feasible. The substance is corrosive and classified accordingly: exemptions are therefore offered for acute oral and dermal toxicity. Several non-standard studies on acute inhalation toxicity in rats and mice have shown that the substance is toxic by inhalation. 9850 mg/m³/ air in rats exposed for 60 minutes.

	Dose of impact	Biological species	Method	Note
Acute oral toxicity	LD50 350 mg/kg live weight	Male white rats	Severe oral toxicity	Actual analysis
Acute dermal toxicity	LD50			Refused due to the toxicity of the substance.
Acute toxicity by inhalation	LC50 28130 - 13770 mg/m³	Male and female white rats	Assessment of strong inhalation toxicity by rats after different exposure periods.	The results are in the exposure range from 10 minutes to 60 minutes.

Skin corrosion/irritation: Causes severe burns on human skin. No skin irritation testing is necessary because contact with ammonia causes direct corrosion on the skin.
Serious eye damage/irritation: Causes severe eye irritation. No examination has been performed, but based on the results of skin irritation, it can be assumed that there will be eye irritation.
Airway or skin sensitization: No information available. Due to its corrosiveness, no sensitization testing is required.

	Exposure time	Biological species	Evaluation	Method	Note
Initial skin irritation:	none	A man	Corrosive	none	A pH of 10 was set for the skin.
Eye irritation	none	none	Highly irritating	none	No study has been performed, but based on the results of the skin irritation, it can be assumed that there will be eye irritation.

Germ cell mutagenicity: There are no indications of mutagenicity after testing *the in vitro* Bacterial Reverse Mutation method and *the in vivo* Micronucleus method.

Carcinogenicity: In accordance with 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 cancer development. 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 dataset.

Reproductive/developmental toxicity: There is no indication of toxicity affecting reproduction.

SRT (Specific Organ Toxicity) – Single Exposure/Multiple Exposure:

STOO	Dose of impact	Value	Exposure time	Biological species	Method	Evaluation
Medium-strong through the mouth	68 mg/kg bw/d	NOAEL	35 days	Crj: CD(SD) male and female rats	Combined Dose Repeatability Toxicity Study and Reproduction/Growth Toxicity Study	No pronounced toxicity
Moderate chronic inhalation	LC50 35 - 63 mg/m^3	NOAEC	50 days	Male white rats	Moderately chronic toxicity when inhaling ammonia from a 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(12.6) of the factsheet. There is no other information available.

Section 12. Information about ecology

12.1 Toxicity

Ammonia is toxic to aquatic organisms.

Toxicity to aquatic organisms	Dosage impact	Exposure time	Biological species	Method	Evaluation	Note
Strong toxicity to fish	LC50	96 h	*Rainbow trout (Onchorynchus mykiss)*		0.89 mg/L of non-ionised ammonia.	The result is pH and temperature regulation.
Strong toxicity to daphnia	EC50	48 h	*Daphnia magna*	Freshwater, static, ASTM E729-80 compliant.	101 mg/L	Results, based on mortality.
Strong algae toxicity	EC50	18 days	*Chlorella vulgaris (Chlorella vulgaris)*	Freshwater, static	7200 mg/L	Result based on the number of cells

Chronic toxicity to fish	LOEC	73 days	*Rainbow trout (Onchorynchus mykiss)*		0,022 mg/L	Result, based on mortality
Chronic toxicity to daphnia	NOEC	96 h	*Daphnia magna*	Freshwater Flow – equal to or similar to EPA OPPTS 850.1300 (Chronic Toxicity Test for Daphnia)	0.79 mg/L of non-ionised ammonia.	Result, based on mortality.

12.2 Stability and degradability
It is not considered sustainable and is rapidly degradable in water systems. In an abiotic environment, ammonia is absorbed by algae and macrophytes for use as a source of nitrogen.

12.3 Bioaccumulative potential
The accumulation of ammonia in flora and fauna is not considered essential in the environment, since 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 because of the excretory process in animals. Since ammonia is a product of normal metabolism, it is not expected to be bioaccumulative.

12.4 Mobility in the soil
It is expected that there will be limited mobility in the soil due to the strong adsorption of ammonium ions by clay minerals and bacterial oxidation in nitrate. Ammonia in the soil is in dynamic equilibrium with nitrate and other substances in the nitrate circle.

12.5 Results of sustainability, bioaccumulative and toxicity assessment and high persistence and strong bioaccumulative
The substance has not been identified as persistent, bioaccumulative and toxic (PVT).

12.6Endocrine disrupting properties
There is no data available on endocrine-disrupting properties.

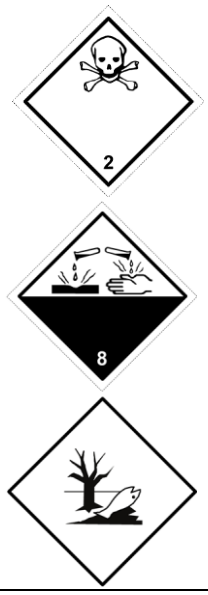
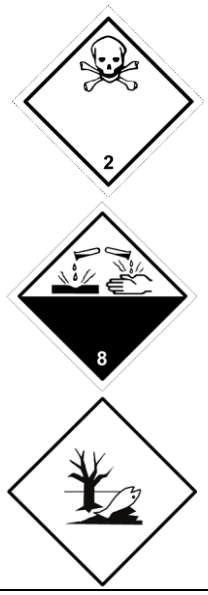
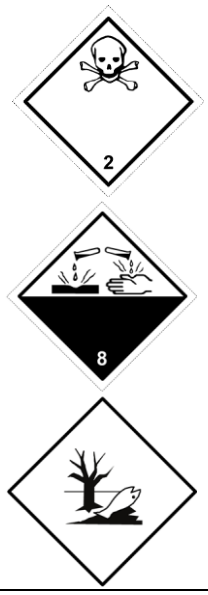
12.7 Other adverse effects
No further information is available.

Section 13. Waste treatment

13.1 Waste treatment methods

Dispose in accordance with all applicable local and national regulations.
Disposal methods: Empty packaging may contain vapor, cannot be cut, ground or welded. Use only authorized transport companies and for recycling or disposal of waste. Treat the latter as hazardous waste. Comply with all applicable local and national legal regulations.
Information on waste treatment: Packaging waste should be collected and stored separately in designated and designated places, until it is handed over to authorized treatment companies.
Information on discharge into the sewerage system: Contaminated water should not be disposed of by discharge into the sewerage system, water sources, soils or groundwater.
Please follow all local, municipal, national and international laws.

Section 14. Transportation information *I7*

	ADG	ADR/RID	IMDG	IATA
UN number	UN1005	1005	1005	1005
UN Transport Name	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS Marine pollutant	AMMONIA, ANHYDROUS
Transport hazard classes	2.3 	2 	2.3 	2.3 
Packing group	Not applicable.			
Environmental hazards	Yes. Marking for an environmentally hazardous substance is not mandatory.		Yes.	Yes.

Further information

ADG : Code of Action for Emergencies or Hazardous Chemicals: 2XE

ADR/RID : Hazard ID 268
Tunnel Constraints Code (C/D)
Code of Action for Emergencies or Hazardous Chemicals: 2XE

IMDG : IMDG Code Separation Group: SG18
Emergency Schedules (EmS): F-C, S-U

Special precautions for consumers : Transportation within user premises: Make sure that people transporting the product know what to do in the event of an accident or spill.

Transportation in bulk according to IMO Not applicable.

Section 15. Information under the current legal framework

15.1 Safety, health and environmental regulations/legislation specific to the substance or mixture
Regulation EC 1907/2006 (REACH), Directive 96/82 EC (Seveso), Directive 98/24 EC, Regulation EC 272/2008 (CLP);
Environmental Protection Act, Appendix 3 - the thresholds for minimum quantities are:
1) 50 tons; 2) 200 t.

15.2 Chemical safety assessment
Pursuant to Article 14 of the REACH Regulation, a safety assessment of this substance has been carried out.

Section 16. Other information

Specifying changes: Changes in the latest release are indicated with *I7*. This version replaces all previous versions.
List of Exposure Scenarios (CoE)*
CE 15: Distribution and formulation of anhydrous ammonia
CE 16: Industrial end-use of anhydrous ammonia in industrial refrigeration systems
Coe 19: Industrial use of anhydrous ammonia as an intermediate
CE 1: Industrial end-use of anhydrous ammonia (heat transfer fluid, e.g. cooling systems, cooling/heating)
CE 2: Industrial end-use of anhydrous ammonia (nutrient, e.g. pharmaceuticals, food, biofuel)
CE 3: Industrial end-use of anhydrous ammonia (reduction of NOx and SOx in flue gases)
CE 4: Industrial end-uses of anhydrous ammonia and ammonia water (part of specialty chemicals/other products, (e.g. photochemicals)
Coe 5: Industrial end-uses of anhydrous ammonia and ammonia water (process aids, non-process aids, auxiliary)
CE 6: Industrial end-use of anhydrous ammonia and ammonia water (reactive agent/processing aid and for general chemical applications, e.g.: extraction, water treatment/septicity control, pH/neutralising agent)
CE 7: Industrial end-uses of anhydrous ammonia and ammonia water (surface treatment/articles, e.g. metal, leather/textiles, plastics, wood, electronics/semiconductors, insulation, curing, etching)
CE 8: Widespread end-use: professional uses of anhydrous ammonia and aqueous solution of ammonia (formulation or mixtures)
CE 9: Widespread end-use: Professional use of anhydrous ammonia and aqueous ammonia solution (heat transfer fluid, e.g. refrigeration, cooling/heating systems)
CE 10: Widespread end-use: Professional uses of anhydrous ammonia and aqueous ammonia solution (laboratory/research chemical)
CE 11: Widespread end-use: Professional use of anhydrous ammonia and aqueous ammonia solution (reactive agent/processing aid, general chemical applications, e.g. pH/neutralizing agent, water treatment)
CE 12: Widespread end-use: Professional uses of anhydrous ammonia and aqueous solution of ammonia (surface treatment/articles, e.g. metal, textiles/leather, plastics, wood, concrete etching)
* Depending on your identified use, the relevant CEs will be provided.

16.1 Hazard Warnings
The full texts of each classification are used in Sections 2.1 and 3 of the Classification under Regulation 1272/2008 (CLP):
Classification according to Regulation 1272/2008 (CLP)
H221 Flammable Gas
H280 Contains pressurized gas; may explode when heated
H331 Toxic by inhalation
H314 Causes severe skin burns and serious eye damage
H400 Highly toxic to aquatic organisms
H411 Toxic to aquatic organisms, with a long-lasting effect.
EUH 071 – Corrosive to the respiratory tract

16.2 Other hazards:

Not considered PBT or vPvB

16.3 Other information: Provide adequate information, instructions and training to operators. Provide regular training to all transport staff (according to ADR Chapter 1.3).

16.4 Revision:

Version:	07
Date of preparation:	June, 2026
Previous Version:	April,2023
Publisher information:	This version replaces all previous documents
Data Source:	Chemical Safety Report 2023, Ammonia, Anhydrous, FARM REACH Consortium

16.5 Abbreviations, abbreviations:

ADR: European Agreement on International Transport by Road of Dangerous Goods
CAS: Chemical References Service
EC: European Community
EN: European standard
ERC: Environmental Release Category
EU: European Union
EUH: European Hazard Statement
GHS: Global Harmonized System
LC50: Average lethal dose
DNEL: Predictable exposure level with no effect
NOAEC/NOAEL: Concentration/Level of Unobserved Harmful Effect
OECD: Organisation for Economic Co-operation and Development
PBT: Persistence, bioaccumulativeness, toxicity
vPvB: High resistance and strong bioaccumulative capacity
PTFE: Polytetrafluoroethylene
PNEC: Predictable exposure concentration without effect
PVC: Polyvinyl chloride
STEL: Short-term exposure limit

Note: The above information in accordance with the applicable regulations only indicates the principles of regulations applicable specifically to the product described in the Safety Data Sheet. The user's attention is drawn to the possible existence of additional regulations that supplement these regulations.