Nutrien
Feeding the Future™

SAFETY DATA SHEET

ANHYDROUS AMMONIA

Section 1. Identification

Product identifier : ANHYDROUS AMMONIA

Product code : AMM, AMMR, AMMMET, 2501-13001, 506-31636, 506-9201

SDS # : N-2187

Other means of identification : This safety data sheet applies to the following:
Anhydrous Ammonia Industrial Grade
Anhydrous Ammonia Commercial Grade
Anhydrous Ammonia Refrigeration Grade
Anhydrous Ammonia Metallurgical Grade
Anhydrous Ammonia, Agricultural Grade 82-0-0

Product type : Liquefied gas.

Relevant identified uses of the substance or mixture and uses advised against

Identified uses
Fertilizer. Refrigerant. Manufacture of specialty fertilizers. Manufacture of chemical products.

Uses advised against
Product is not intended for consumer use.

Supplier's details : PCS Sales (Canada), Inc. (A Subsidiary of Nutrien Ltd.)
Suite 1700
211 - 19th Street East
Saskatoon SK S7K 5R6
Canada

Agrium Canada Partnership (A Subsidiary of Nutrien Ltd.)
13131 Lake Fraser Drive S.E.
Calgary AB T2J 7E8
Canada

Telephone no. : 1-800-524-0132

Email : sds@nutrien.com

Emergency telephone number (with hours of operation) : CHEMTREC (24 hrs) 1-800-424-9300 or +1-703-527-3887

Section 2. Hazard identification

Classification in accordance with the Hazardous Products Regulations (SOR/2015-17; SOR/2022-272)

Classification of the substance or mixture : FLAMMABLE GASES - Category 2
GASES UNDER PRESSURE - Liquefied gas
ACUTE TOXICITY (inhalation) - Category 3
SKIN CORROSION - Category 1B
SERIOUS EYE DAMAGE - Category 1
Health Hazards Not Otherwise Classified - Category 1

GHS label elements

Section 2. Hazard identification

Hazard pictograms :

Signal word : Danger

Hazard statements :
Flammable gas.
Contains gas under pressure; may explode if heated.
Causes severe skin burns and eye damage.
Toxic if inhaled.
Causes respiratory tract burns.
Causes digestive tract burns.

Precautionary statements

Prevention : Wear protective gloves, protective clothing and eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only outdoors or in a well-ventilated area. Avoid breathing gas. Wash thoroughly after handling.

Response : Leaking gas fire: Do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

Storage : Store locked up. Protect from sunlight. Store in a well-ventilated place.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Keep container tightly closed. Do not breathe gas. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling.

Hazards not otherwise classified : Contact with water results in a significant release of toxic vapor.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Ingredient name	% (v/v)	Identifiers
ammonia	99.50 - 99.98	CAS: 7664-41-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact : CORROSIVE. Begin eye irrigation immediately. All eye exposures require medical evaluation following decontamination. Immediately rinse eyes with large quantities of water or saline for a minimum 30 minutes, longer irrigation time is preferred if possible. If possible, remove contact lenses being careful not to cause additional eye damage. If the initial water supply is insufficient, keep the affected area wet with a moist cloth and transfer the person to the nearest place where rinsing can be continued for the recommended length of time. Call an ambulance for transport to hospital. Continue eye irrigation during transport. For additional advice call the medical emergency number on this safety data sheet or your poison center or doctor.

Inhalation : CORROSIVE. If gases or vapors exceed the IDLH or are present in unknown concentrations, rescuers must wear self-contained breathing apparatus and a suit resistant to gases (Level B). In the U.S., OSHA HAZWOPER requirements under 29CFR1910.120 overrule the lesser protection requirements given in the anhydrous ammonia standard, 1910.111.
REMOVE PERSON TO FRESH AIR. Watch closely for signs of wheezing and breathing difficulties. Maintain an open airway. If not breathing, begin CPR. Oxygen may be administered by trained personnel. Affected persons who have stopped breathing or are having difficulty breathing or are unconscious need immediate medical attention. Symptoms may be delayed after exposure to anhydrous ammonia. The exposed person may need to be kept under medical surveillance for 24 - 48 hours. Call an ambulance for transport to hospital. For additional advice call the medical emergency number on this SDS or your poison center or doctor.

Skin contact : To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. CORROSIVE. Immediately begin rinsing the affected areas with water. Remove contaminated clothing and shoes. Affected areas should be rinsed for a minimum 30 minutes, longer irrigation time is preferred if possible, due to the chemical reactions that occur. Luke-warm water is recommended for continued irrigation to prevent hypothermia. Conscious persons without breathing difficulties may benefit from prolonged irrigation in a fixed shower or bathing facility prior to hospital transport. Call an ambulance for transport to hospital. Continue skin irrigation during transport. For additional advice call the medical emergency number on this safety data sheet or your poison center or doctor. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : CORROSIVE. If the affected person requires cardiopulmonary resuscitation, avoid mouth to mouth contact.Get medical attention immediately. Never give anything by mouth to an unconscious person. Chemical burns must be treated promptly by a physician. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Corrosive to eyes. Causes serious eye damage. Liquid can cause burns similar to frostbite. Eye contact can result in temporary or permanent corneal damage and/or blindness. The full extent of damage to the eyes may not be known for 1 week after injury.

Inhalation : Toxic if inhaled. Corrosive to the respiratory system. May cause severe breathing difficulties.

Section 4. First-aid measures

Skin contact : Corrosive to the skin. Causes severe burns. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion : Corrosive to the digestive tract. Causes burns. Ingestion of liquid can cause burns similar to frostbite.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness
frostbite
loss of vision

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
frostbite

Ingestion : Adverse symptoms may include the following:
frostbite
throat and stomach pain
bloating
nausea or vomiting

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Do not attempt to use chemicals to neutralize the exposure. Gas inhalation may cause delayed pulmonary symptoms (acute lung injury).

Specific treatments : Anhydrous ammonia reacts with moisture to produce ammonium hydroxide. Corrosive hydroxyl ions generated by the production of ammonium hydroxide rapidly penetrate the skin, eyes, and mucous membranes. Outcomes can be improved by minimizing time to decontamination and extending decontamination times to reduce tissue damage. Expert opinion indicates extended decontamination is required to remove corrosive chemicals. Skin and eye decontamination should be performed for a minimum of 20 minutes, longer irrigation time is preferred if possible. Extended decontamination times may be required depending on the exposure. To avoid hypothermia, irrigation water should be maintained at a comfortable temperature. If the patient is not in extremis, it may be necessary to delay transport to emergency care facilities to ensure adequate decontamination time. However, early patient transport may be necessary depending on patient's condition or the availability of water. If possible, continue skin and/or eye irrigation during emergency medical transport. Double-bag contaminated clothing and personal belongings of the patient.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Decontamination measures may be necessary. Personnel and equipment must be checked and decontaminated prior to leaving the area.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use water spray, fog or foam. Use water spray curtain to divert vapor drift.

Unsuitable extinguishing media : Do not use water jet. Do not direct water into spilled anhydrous ammonia. Ammonia is a cryogenic liquid which cools on evaporation limiting vapor release. Water used for fire fighting will raise the temperature of ammonia resulting in greater vapor release.

Specific hazards arising from the chemical : Contains gas under pressure. Flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
nitrogen oxides
toxic and corrosive fumes
Ammonia

Special protective actions for fire-fighters : No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Contact supplier immediately for specialist advice. Eliminate all ignition sources if safe to do so. Move containers from fire area if this can be done without risk. If involved in fire, shut off flow immediately if it can be done without risk. Use water spray to keep fire-exposed containers cool. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Contain and collect the water used to fight the fire for later treatment and disposal.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

Remark : Product will burn with difficulty if kept between the Lower Explosive Limit of 16% and Upper Explosive Limit of 25%. This product is generally regarded as non-flammable due to the difficulty of ignition. However, the presence of oil or other combustible materials will increase the fire hazard, and may ignite with explosive force under favorable conditions. If mixed with chlorine or hypochlorites, it may form nitrogen trichloride which may explode spontaneously in air.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : Fully-encapsulating, vapor-protective clothing should be worn for spills and leaks without fire. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Do not direct water into spilled anhydrous ammonia. Ammonia is a cryogenic liquid which cools on evaporation limiting vapor release. Water used for fire fighting at supplied temperatures will raise the temperature of ammonia resulting in greater evaporation.

Section 6. Accidental release measures

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused adverse impacts (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Do not breathe gas. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Further manufacturing processes must be managed by trained professionals in a properly equipped facility.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Incompatible with copper alloys. Contact your sales representative or a metallurgical specialist to ensure compatibility with your equipment.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
ammonia	**ACGIH TLV (United States, 1/2024) [Ammonia]** TWA 8 hours: 25 ppm. TWA 8 hours: 17 mg/m³. STEL 15 minutes: 35 ppm. STEL 15 minutes: 24 mg/m³. **Saskatchewan Provincial:** (Canada) TWA 8 hours: 25 ppm. STEL 15 minutes: 35 ppm.

Section 8. Exposure controls/personal protection

	Manitoba Provincial: (Canada) TWA: 25 ppm. STEL: 35 ppm. **British Columbia Provincial:** (Canada, 9/2024) [ammonia] TWA 8 hours: 25 ppm. STEL 15 minutes: 35 ppm. **CA Ontario Provincial (Canada, 6/2019) [Ammonia]** TWA 8 hours: 25 ppm. STEL 15 minutes: 35 ppm. **CA Quebec Provincial.** (Canada, 2/2024) [Ammonia] TWAEV 8 hours: 25 ppm. TWAEV 8 hours: 17 mg/m³. STEV 15 minutes: 35 ppm. STEV 15 minutes: 24 mg/m³. **CA Alberta Provincial:** (Canada, 3/2023) [Ammonia] OEL 8 hours: 17 mg/m³. OEL 8 hours: 25 ppm. OEL 15 minutes: 35 ppm. OEL 15 minutes: 24 mg/m³.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Contact your personal protective equipment supplier to verify the compatibility of the equipment for the intended purpose.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. Recommended: butyl rubber, neoprene rubber, nitrile rubber, Viton®.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Under emergency conditions, or where contact with liquid anhydrous ammonia or high concentration gas is probable, a chemically resistant, gas tight, encapsulating suit with positive pressure self contained breathing apparatus is required. For accidental splash protection against the liquid, chemically resistant impervious coveralls or a chemical resistant suit should be worn.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: Impervious rubber safety boots.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Use a NIOSH approved chemical cartridge or canister respirator with a full facepiece for ammonia concentrations up to 300 PPM. Use a positive pressure SCBA for concentrations above 300 PPM, for emergency response, or for entry into unknown concentrations.

Thermal hazards : If there is a risk of contact with the liquid, all protective equipment worn should be suitable for use with extremely low temperature materials. Contact with rapidly expanding gas may cause cold burns or frostbite. Wear cold insulating gloves.

Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

Physical state : Gas.

Color : Colorless.

Odor : Pungent. Ammoniacal. [Strong]

Odor threshold : 5 to 50 ppm

pH : 11.6 [Conc. (% w/w): 1.7%]

Melting point/freezing point : -77.7°C (-107.9°F) [EU A.1]

Boiling point or initial boiling point and boiling range : -33°C (-27.4°F)

Flash point : Not applicable.

Evaporation rate : Not applicable.

Flammability : Flammable

Lower and upper explosion limit/flammability limit : Lower: 16%
Upper: 25%

Section 9. Physical and chemical properties

Vapor pressure : 843 kPa (6323 mm Hg) [20°C (68°F)]
2032.5 kPa (15245 mm Hg) [50°C (122°F)]

Relative vapor density : 0.59 [Air = 1]

Relative density : 0.61 to 0.68

Solubility(ies) :

Media	Result
cold water	Easily soluble
hot water	Soluble
Methanol	Partially soluble

Solubility in water : 540 g/l

Partition coefficient: n-octanol/water : 0.23

Auto-ignition temperature : 651°C (1203.8°F)

Decomposition temperature : Not available.

Heat of combustion : -18589392 J/kg

Viscosity : Not applicable.

Particle characteristics

Median particle size : Not applicable.

Section 10. Stability and reactivity

Reactivity : Reactive with acids

Chemical stability : The product is stable.

Possibility of hazardous reactions : If mixed with chlorine or hypochlorites, it may form nitrogen trichloride which may explode spontaneously in air.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Extremely reactive or incompatible with acids. Highly reactive with oxidizing agents and reducing agents. Forms explosive compounds with many heavy metals such as mercury or silver. May react explosively with chlorine, hypochlorites such as bleach or chlorinating chemicals and other halogens such as bromine, iodine, fluorine or their compounds.
Highly corrosive to copper and its alloys. Slightly corrosive to aluminum and zinc. Very slightly corrosive to mild steel. Non-corrosive to glass or stainless steel (304 or 316). Do not use copper, brass, bronze, or galvanized steel in contact with ammonia. Do not use brazed joints in ammonia service. Contact your sales representative or a metallurgical specialist to ensure compatibility with your equipment.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result
ammonia	**Rat - Inhalation - LC50 Gas.** 9500 ppm [1 hours] **Rat - Inhalation - LC50 Gas.** 2000 ppm [4 hours] **Rat - Inhalation - LC50 Vapor** 4673 mg/m³ [4 hours]

Conclusion/Summary [Product] : Toxic if inhaled. Corrosive to the digestive tract.
Up to 25 PPM - unpleasant and pungent smell
Above 25 PPM - irritation of the eyes, nose and throat
Above 300 PPM - immediately dangerous to life and health (IDLH)
Above 1000 PPM - increasing chest tightness, brochospasm and severe eye and skin irritation with possible delayed effects, such as chemical pneumonitis and pulmonary edema
Exposure to high concentrations (>5,000 ppm) may cause death.

Effects may be more pronounced at lower concentrations in children, the elderly, and persons with impaired lung function.

Skin corrosion/irritation

Conclusion/Summary [Product] : Corrosive to the skin.

Serious eye damage/eye irritation

Conclusion/Summary [Product] : Corrosive to eyes.

Respiratory corrosion/irritation

Conclusion/Summary [Product] : Corrosive to the respiratory tract.

Respiratory or skin sensitization

Skin

Conclusion/Summary [Product] : No known significant effects or critical hazards.

Respiratory

Conclusion/Summary [Product] : No known significant effects or critical hazards.

Germ cell mutagenicity

Conclusion/Summary [Product] : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary [Product] : No known significant effects or critical hazards.

Reproductive toxicity

Section 11. Toxicological information

Conclusion/Summary [Product] : No known significant effects or critical hazards.

Specific target organ toxicity (single exposure)

Based on available data, the classification criteria are not met.

Specific target organ toxicity (repeated exposure)

Based on available data, the classification criteria are not met.

Aspiration hazard

Based on available data, the classification criteria are not met.

Information on the likely routes of exposure

Dermal contact. Eye contact. Inhalation.

Potential acute health effects

Eye contact : Corrosive to eyes. Causes serious eye damage. Liquid can cause burns similar to frostbite. Eye contact can result in temporary or permanent corneal damage and/or blindness. The full extent of damage to the eyes may not be known for 1 week after injury.

Inhalation : Toxic if inhaled. Corrosive to the respiratory system. May cause severe breathing difficulties.

Skin contact : Corrosive to the skin. Causes severe burns. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion : Corrosive to the digestive tract. Causes burns. Ingestion of liquid can cause burns similar to frostbite.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness
frostbite
loss of vision

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
frostbite

Ingestion : Adverse symptoms may include the following:
frostbite
throat and stomach pain
bloating
nausea or vomiting

Delayed and immediate effects and also chronic effects from short and long term exposure

Section 11. Toxicological information

Short term exposure

Potential immediate effects : See above.

Potential delayed effects : In case of inhalation, symptoms may be delayed. Observation may be warranted. Pulmonary edema may occur several hours after exposure.

Long term exposure

Potential immediate effects : See above.

Potential delayed effects : See below.

Potential chronic health effects

Conclusion/Summary [Product] : No known significant effects or critical hazards.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
ammonia	N/A	N/A	2000	N/A	N/A

Other information

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result
ammonia	**Acute - LC50 - Fresh water** Fish - Carp - *Hypophthalmichthys nobilis* 300 µg/l [96 hours] **Acute - LC50 - Fresh water** Daphnia - Water flea - *Daphnia magna* 0.53 ppm [48 hours] **Acute - EC50 - Marine water** Algae - Sea Lettuce - *Ulva fasciata* - Zoea 29.2 mg/l [96 hours] **Chronic - NOEC - Marine water** Fish - Sea bass - *Dicentrarchus labrax* 0.204 mg/l [62 days]

Conclusion/Summary [Product] : Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Persistence and degradability

Section 12. Ecological information

Not available.

Conclusion/Summary [Product] : Not persistent. Readily biodegradable.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
ammonia	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
ammonia	0.23	-	Low

Mobility in soil

Soil/Water partition coefficient : Not available.

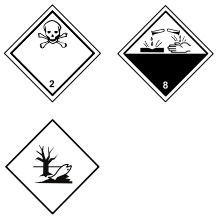
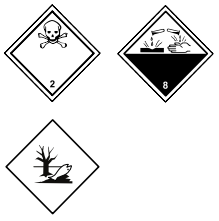
Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	TDG Classification	DOT Classification	IMDG	IATA
UN number	UN1005	UN1005	UN1005	UN1005
UN proper shipping name	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS	AMMONIA, ANHYDROUS
Transport hazard class(es)	2.3 (8) 	2.2 	2.3 (8) 	2.3 (8) 
Packing group	-	-	-	-

Section 14. Transport information

Environmental hazards	Yes.	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.

Additional information

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.40-2.42 (Class 8), 2.7 (Marine pollutant mark).
Toxic - Inhalation hazard
The marine pollutant mark is not required when transported solely by road or rail.
Explosive Limit and Limited Quantity Index 0
ERAP Index 3000
Special provisions 23, 158

DOT Classification : **Except when all or part of the transportation is by vessel, the marine pollutant mark does not apply to non-bulk packages transported domestically by motor vehicle, rail car or aircraft.**
Toxic - Inhalation hazard Zone D
This product is not regulated as a marine pollutant when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes, provided the packagings meet the general provisions of §§ 173.24 and 173.24a.
Reportable quantity 100.26 lbs / 45.518 kg.
Packaging instruction Exceptions: None. Non-bulk: 304. Bulk: 314, 315.
Special provisions 4, 379, N87, T50
Remarks The letters “RQ” must also be entered on the shipping paper either before or after the basic description when the quantity in a package exceeds the reportable quantity.
Shipments of anhydrous ammonia within Canada using the DOT green 2.2 Placard are prohibited.
Shipments originating in Canada going to the United States are to be placarded with the White UN 1005 Anhydrous Ammonia Placard. DOT rules allow shipments to proceed between the U.S. and Canada with this placard. Domestic shipments within the U.S. must continue to use the green DOT 2.2 non-flammable compressed gas placard.

IMDG : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.

Special precautions for user : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Refer to the North American Emergency Response Guidebook, Guide 125 for further information regarding spill control and Isolation / Protective Action Distances Guidelines.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : The following components are listed: ammonia (total)

CEPA Toxic substances : The following components are listed: gaseous ammonia

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Section 15. Regulatory information

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : All components are listed or exempted.

Canada : All components are listed or exempted.

China : All components are listed or exempted.

Eurasian Economic Union : **Russian Federation inventory**: All components are listed or exempted.

Japan : **Japan inventory (CSCL)**: All components are listed or exempted.
Japan inventory (ISHL): All components are listed or exempted.

New Zealand : All components are listed or exempted.

Philippines : All components are listed or exempted.

Republic of Korea : All components are listed or exempted.

Taiwan : All components are listed or exempted.

Thailand : All components are listed or exempted.

Turkey : All components are listed or exempted.

United States : All components are active or exempted.

Viet Nam : All components are listed or exempted.

Section 16. Other information

History

Date of issue/Date of revision : 12/15/2025

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Version : 1

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
DOT = Department of Transportation
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
HPR = Hazardous Products Regulations
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
IMO = International Maritime Organization
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SGG = Segregation Group
TDG = Transportation of Dangerous Goods
UN = United Nations

Procedure used to derive the classification

Section 16. Other information

Classification	Justification
FLAMMABLE GASES - Category 2	On basis of test data
GASES UNDER PRESSURE - Liquefied gas	On basis of test data
ACUTE TOXICITY (inhalation) - Category 3	Calculation method
SKIN CORROSION - Category 1B	Expert judgment
SERIOUS EYE DAMAGE - Category 1	On basis of test data
Health Hazards Not Otherwise Classified - Category 1	Calculation method

References : 29 CFR 1910.111, US Occupational Health and Safety Administration.
29 CFR 1910.119, US Occupational Health and Safety Administration.
Anhydrous Ammonia Code of Practice, Fertilizer Canada. Current revision at time of SDS preparation.
NFPA 400 Hazardous Materials Code, National Fire Protection Association. Current edition at time of SDS preparation.

Indicates information that has changed from previously issued version.

Notice to reader

Supply chain partners must ensure they pass this SDS, and all other relevant safety information to their customers.

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