

SAFETY DATA SHEET

in accordance with Regulation (EC) 1907/2006 (REACH) and its amendments

■ **V12** - amendments in this revision ■

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING	
1.1 Product identifier	
Trade name	Ammonia, Anhydrous
Synonyms	Ammonia, liquid ammonia, liquefied ammonia
EC number:	231-635-3
CAS number:	7664-41-7
Index number:	007-001-00-5
REACH registration number:	01-2119488876-14-0004
NEOCHIM PLC code	14-01
1.2 Relevant identified uses of the substance or mixture and uses advised against	
Relevant identified uses:	Intermediate, distribution and formulation, refrigerant etc. Note: see SECTION 16 for the list of exposure scenarios describing the identified uses ■.
Uses advised against:	The use of the substance recommend to be limited to those specified in the Section 16.
1.3 Details of the supplier of the safety data sheet	
Manufacturer: ■ V12 Address: Tel.: URL website: E-mail:	NEOCHIM PLC East Industrial Zone, Himkombinatska Str. 6403 Dimitrovgrad, Bulgaria +359 391 65 205 http:// www.neochim.bg office@neochim.bg ■
E-mail of the competent person for safety data sheet	reach-neochim@neochim.bg
1.4 Emergency telephone number	
National Toxicology Center Hospital for Active Medical Treatment and Emergency Medicine "N.I.Pirogov"	+ 359 2 9154 233 24/24 h 7/7 d
SECTION 2: HAZARDS IDENTIFICATION	
Physical and chemical hazards	Flammable
Potential effects on health	Inhalation: Toxic by inhalation. Inhalation exposure at low concentration, coughing, irritation of the respiratory tract, eye irritation and lacrymation, wet noses and nasal discharge occur. Inhalation at higher concentration can cause burning of the nose, throat and respiratory tract and bronchiolar and alveolar oedema, dyspnea, bronchospasm and respiratory distress also occur. Skin contact: Liquid ammonia splashes cause severe cold burns to skin. Vapour in presence of moisture is an irritant to the skin. Eye contact: Liquid ammonia splashes cause permanent damage to eyes with the full effects not being apparent for several days. Vapours can cause irritation and watering of eyes and at high concentrations can cause severe damage.

No mutagenic activity is expected. There is no evidence of carcinogenicity following exposure. No adverse reproductive effects are likely to occur following exposure and no effect on spontaneous abortion was observed. Environmental hazards: Considered toxic to aquatic life.

2.1 Classification of the substance or mixture

2.1.1 Classification of the substance or mixture in accordance with Regulation 1272/2008 (CLP) and its amendments at the date of the issue of the document

Flammable gas, hazard category 2 (Flam. Gas 2), H221
Gas under pressure: Liquefied gas (Liq. Gas.), H280
Acute toxicity (inhalation), hazard category 3 (Acute Tox 3), H331
Skin corrosion/irritation, hazard category 1B (Skin Corr. 1B), H314
Hazardous to the aquatic environment- Acute aquatic hazard 1 (Aquatic Acute 1), H400
Hazardous to the aquatic environment- Aquatic Chronic hazard 2 (Aquatic Chronic 2), H411
Corrosive to the respiratory tract, EUH 071

2.1.2 Additional information

For full text of H statement: see Section 16

2.2 Label elements

Labelling in accordance with Regulation 1272/2008 (CLP) and its amendments at the date of the issue of the document

Hazard pictogram(s):



Signal word

Danger

Hazard statement(s):

H221
H280
H331
H314
H410

Flammable gas.
Contains gas under pressure; may explode if heated.
Toxic if inhaled.
Causes severe skin burns and eye damage.
Very toxic to aquatic life with long lasting effects.

Precautionary statement(s):

P210
P260
P273
P280

P303+P361+
P353
P305+P351+
P338
P304+P340
P310
P410+P403
P411

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Do not breathe gas, vapours and aerosols.
Avoid release to the environment.
Wear chemically resistant gloves, full face mask with gas filter and protective clothes
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a Poison Centre or doctor/physician.
Protect from sunlight. Store in a well ventilated place.
Store gas cylinders at temperatures not exceeding 50°C

2.3 Other hazards

EUH 071 – Corrosive to the respiratory tract

PBT/vPvB criteria:

Substance does not meet the criteria for vPvB and PBT according to Regulation (EC) 1907/2006, Annex XIII

Endocrine disrupting properties

Data lacking

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Substance name	Index number in CLP, Annex VI.	Weight % content (or range)	M-factor
Ammonia, Anhydrous	007-001-00-5	99.9-99.99	M=1(Aquatic acute)

SECTION 4: FIRST- AID MEASURES

4.1 Description of first aid measures

- general notes	Speed is essential. If unconscious, place casualty in a recovery position with head sideways to avoid choking. Provide shower and eye wash station near the workplace.
- following inhalation	Move patient immediately to fresh air and keep at rest in a half upright position. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. If trained to do so administer supplemental oxygen with assisted ventilation. Get medical attention immediately
- following skin contact - following frosting (from evaporate liquid)	Remove all contaminated clothing. Immediately flush exposed area with copious amounts of tepid water for at least 15 minutes followed by washing area thoroughly with soap and water. The patient should be seen in a health care facility if irritation or pain persists. In case of frost bite clothing may adhere to the skin. Defrost with care using comfortable warm water. Remove clothing and wash affected parts.
- following eye contact	Immediately flush eyes with copious amounts of tepid water for at least 15 minutes. Remove contact lenses, if present and easy to do. If irritation, pain, swelling, excessive tearing, or light sensitivity persists, the patient should be seen in a health care facility and referral to an ophthalmologist considered.
- following ingestion	Unlikely route of exposure. Get medical attention immediately. If the person is conscious, wash out mouth with water and give water to drink. Do NOT induce vomiting.
- self-protection of the first aider	First aiders should be protected adequately – gloves, protective goggles and gas filter

4.2 Most important symptoms and effects

Acute effects	Cause suffocation, coughing, sore eyes, redness of the skin with the appearance of red spots and blisters, dizziness, stomach pain and vomiting.
Delayed effects	Pulmonary oedema may occur up to 48 hours after exposure and could prove fatal depending on exposure and concentration.

4.3 Indication of any immediate medical attention and special treatment needed

Stop contact with ammonia immediately. Apply oxygen respiration, if necessary - tracheotomy and assisted respiration if needed. Glicocorticoide - aqueous solution 50-100 mg intravenously - in case of vocal cords oedema, in other cases - apply small doses orally. Treat symptomatically - antitussive detergents, analgesics and others.

SECTION 5: FIRE - FIGHTING MEASURES

5.1 Extinguishing media

Suitable:	Use fire extinguishers appropriate to local circumstances and the surrounding environment like water fog, dry chemical, carbon dioxide (CO ₂) or foam.
Unsuitable:	Do not use a water jet for extinguishing

5.2 Special hazards arising from the substance or mixture

Exposure to fire may cause the vessel to burst/explode

Hazardous combustion products: The following toxic and/or corrosive substances may be formed under the influence of fire during thermal decomposition: Nitrogen monoxide / nitrogen dioxide

Anhydrous ammonia was found to be flammable, with a lower explosion limit of 16% vol. and an upper explosion limit of 25% vol. Gives off hydrogen by reaction with metals. Contact with water may produce heat release and presents risks of splashing.

5.3 Advice for firefighters

Stopping the flow of gas rather than extinguishing the fire is usually the best procedure to follow when escaping gas is burning.

Do not get water inside container.

Move container from fire area if you can do it without risk.

Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks due to exploding potential when tanks are involved in a fire. Re-spontaneous / explosive ignition is possible. To put out any other fire. Isolate area until gas has dispersed.

Use water spray or foam to control vapour

Positive pressure self-contained breathing apparatus (SCBA) should be used when there is a potential for inhalation of vapors and/or fumes. Chemical protective clothing that is safe for use with ammonia involved in a fire should be worn.

SECTION 6: ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

Stop leak if you can do so without risk. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind, out of low areas, and

Ventilate closed spaces before entering. Evaluate the affected area to determine whether to evacuate or shelter-in-place by taping windows and doors, shutting off outside air intakes (attic fans, etc.), and placing a wet towel or cloth over the face (if needed).

With proper training, self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing used in conjunction with water spray will provide limited protection in outdoor releases for short-term exposure.

Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. Use water spray or foam to control vapors. Mixing of water and liquid ammonia will increase vaporization rate. Do not put water on liquid ammonia unless more than 100 volumes of water are available for each volume of liquid ammonia.

6.1.1 For non-emergency personnel

Wear personal protective equipment (PPE) - Wear chemically resistant gloves, full face mask with gas filter and protective clothes

6.1.2 For emergency responders

Chemical resistant personal protective equipment, gloves, boots and self-contained breathing apparatus.

6.2 Environmental precautions

Do not allow contaminated water to enter sanitary sewer system and water sources. Inform authorities in case of accidental contamination of some environmental compartments.

6.3 Methods and material for containment and cleaning up

Small spills dilute with water for disposal. Large spills neutralize with appropriate chemicals eg. monoammonium phosphate. Sweep up and shovel into suitable, closed containers for disposal. Keep in properly labeled containers. Dispose of via a licensed disposal contractor.

6.4 Reference to other sections

See section 8 for personal protective equipment and section 13 for waste disposal.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Use proper personal protective equipment when working with or around ammonia.

Skin protection is required for exposure to liquid, mist, and gas or vapour. Neoprene or rubber gauntlet-type gloves, ammonia resistant clothing (overalls, jacket, and boots) or vapor suit, as required.

Use chemical (indirectly vented) goggles when there is a potential for contact with liquid or mist. A full-face shield is recommended in addition to goggles for added protection.

Safety shower and eyewash fountain should be provided in the ammonia handling area.

Use dedicated containers - do not rinse.

7.2 Conditions for safe storage, including any incompatibilities

Store containers tightly closed in a cool, well-ventilated area.

Engineering controls should be maintained to keep ammonia concentrations within acceptable exposure levels, or respiratory protection will be required to reduce inhalation exposure.

Follow relevant national and industrial regulations for storing large quantities and stored 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 end uses

Local regulations may require specific equipment for storage or use.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure should be limited using appropriate engineering controls (containment, LEV) and protective equipment (gloves, goggles/visor, protective clothing) as appropriate. Engineering controls should be maintained to keep ammonia concentrations within acceptable exposure levels, or respiratory protection will be required to reduce inhalation exposure.

Regulated occupational exposure limit values:

European Union

8 hours exposure: 14mg/m³ or 20ppm

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

Recommended occupational exposure limit values for professional and consumer use (following from the performed CSA)

	DN(M)ELs for workers				DN(M)ELs for consumers			
Route of exposure	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
Oral	Not required					6.8 mg/kg bw/d		6.8 mg/kg bw/d
Inhalation	36 mg/m ³	47.6 mg/m ³	14 mg/m ³	47.6 mg/m ³	7.2 mg/m ³	23.8 mg/m ³	2.8 mg/m ³	23.8 mg/m ³
Dermal	medium hazard (no threshold derived)	medium hazard (no threshold derived)	6.8 mg/kg bw/d	6.8 mg/kg bw/d	medium hazard (no threshold derived)	68 mg/kg bw/d	medium hazard (no threshold derived)	68 mg/kg bw/d
Eyes	Local effects		medium hazard (no threshold derived)		Local effects		medium hazard (no threshold derived)	

Predicted No Effect Concentration (PNEC):

Components	PNEC
freshwater	0.00135mg/L
intermittent releases (freshwater)	0.0083mg/L
marine water	0.00135mg/L
sediments (freshwater)	no hazard identified
sediments (marine water)	no hazard identified
sewage treatment plant	no hazard identified
soil	0.0221mg/kg soil dw
air	no hazard identified
secondary poisoning	no potential for bioaccumulation

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate ventilation. Valves, pipelines and vessels are sealed and insulated and sampling is carried out with a closed sample loop. Ensure safety showers. Handle in accordance with good industrial hygiene and safety practice.

2.2 Personal protective equipment

8.2.2.1 Eye and face protection	Full-face mask complying with EN 136
8.2.2.2 Skin protection <u>Hand protection</u> <u>Other skin protection</u>	Chemical resistant gloves complying with EN 374 should be worn at all times when handling ammonia, including: material - nitrile rubber, neophrene breakthrough time - ≥ 480 min. Permeation resistance class – 6 Please follow the supplier's instructions about conditions of use and expiration date Depending on the risk and on the work performed, adequate protective equipment

	such as long-sleeved overall and shoes should be selected and approved by a specialist.
8.2.2.3 Respiratory protection	In the case of aerosol or vapours of ammonia use respirator with an approved filter. Self-contained breathing apparatus (recommended EN 402) in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection. Use only respiratory protection that conforms to international/national standards. Use EU approved respiratory protection.
8.2.2.4 Thermal hazards	Use appropriate thermal resistant clothing, if necessary
8.2.3 Environmental exposure control	
See annex of this safety data sheet (exposure scenarios)	
SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES	
9.1 Information on basic physical and chemical properties	
a) Physical state	Gas (at 20°C and 101.3 kPa)
b) Colour	Colorless
c) Odour	Characteristic, pungent, suffocating. Odour threshold - 0.6 to 53 ppm
d) Melting/Freezing point	-77.7°C
e) Boiling point;	-33°C at 101.3 kPa
f) Flammability	Anhydrous ammonia is a flammable gas
g) Lower and upper exposure limit	Lower explosion limit of 16% vol. Upper explosion limit of 25% vol.
h) Flash-point	Not applicable as it is a gas
i) Auto-ignition temperature	651°C
j) Decomposition temperature	Not applicable
K) pH 1% aqueous solution	Not applicable
l) Kinematic Viscosity	Not applicable as it is an inorganic gas
m) Solubility	Very soluble in water, approximately 48200-53100 mg/L at 25°C
n) Partition coefficient n-octanol/water:	log Kow: 0.23 at 20°C
o) Vapour pressure:	8611hPa at 20°C
p) Density	0.708kg/m ³ 20°C
q) Relative density	0.588 at 20°C (air density 1.205 kg/m ³)
r) Particle characteristics	not applicable as it is a gas
9.2 Other information	
9.2.1. Information with regards to physical hazard classes	
a) Explosives	Anhydrous ammonia is not predicted to be explosive based on a theoretical assessment of its chemical structure. Explosive when mixed with air in concentration limits 16÷25 vol.%
b) Flammable gases	Flammable gas, hazard category 2
c) Oxidising gases	Anhydrous ammonia is not predicted to be an oxidising agent based on a theoretical assessment of its chemical structure.
d) Gases under pressure	Liquefied gas
9.2.2. Other safety characteristics	

Critical temperature	132°C
Critical pressure	113,0 hPa

SECTION 10: STABILITY AND REACTIVITY
10.1 Reactivity

The product is stable under the recommended conditions in Section 7.

10.2 Chemical stability

No hazardous reaction when handled and stored according to provisions

10.3 Possibility of hazardous reactions

Hydrogen is released on heating above 454°C. The decomposition temperature may 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 gases, which may form a flammable mixture in the air.

Ammonia has potentially explosive or violent reactions with interhalogens, strong oxidisers, nitric acid, fluorine and nitrogen oxide. Ammonia forms sensitive explosive mixtures with air and hydrocarbons, ethanol and silver nitrate and Chlorine. Explosive products are formed by the reaction of ammonia with silver chloride, silver oxide, bromine, iodine, gold, mercury and tellurium halides.

10.4 Conditions to avoid

High temperatures. Bottles should not be exposed to temperatures above 50°C and direct sunlight. Sensitive to shock mixtures are formed with mercury, silver and gold oxides.

10.5 Incompatible materials

Ammonia is incompatible or has potentially hazardous reactions with silver, acetaldehyde, acrolein, boron, halogens, perchlorate, chloric acid, chlorine monoxide, chlorites, nitrogen tetroxide, tin and sulphur.

10.6 Hazardous decomposition products

Nitrogen oxides

SECTION 11: TOXICOLOGICAL INFORMATION
11.1 Information on hazard classes as defined in Regulation (EC) №1272/2008

Acute Toxicity

Acute toxicity, hazard category 3 - Toxic if inhaled

Metod	Species	Route of exposure	Effective dose	Exposure time	Results
Equivalent or similar to OECD Guideline 401 (Acute Oral Toxicity)	rat (Wistar) male	oral: gavage	LD ₅₀ 350 mg/kg bw (male) (Probit analysis)	14 days	
		dermal	LD ₅₀		No data are available. A waiver is proposed as the substance is classified as corrosive. Dermal exposure to anhydrous ammonia will be dominated by local effects at the site of contact and significant systemic toxicity is unlikely.
Assessment of acute inhalation toxicity in the rat/mouse following various exposure periods	rat (Wistar) male/female	inhalation (whole body)	■V12 LC ₅₀ 28130 mg/m ³ LC ₅₀ 13770 mg/m ³ LC ₅₀ 9850 mg/m ³ air ■	10 min – 60 МИН.	Results range from 10 minute exposure to 60 minute exposure ■.

■ **V12** Skin corrosion/irritation:

Ammonia, anhydrous causes burns to skin

Method	Species	Routes of exposure	Result
Guidelines not followed; equivalent or similar to OECD Guideline 401	White rabbit	Skin contact	Corrosive The pH of the skin is found to be 10

Serious eye damage/ irritation:

Causes serious eye damage

Respiratory or skin sensitisation:

Based on available data, the classification criteria are not met

There is no evidence that ammonia causes skin or respiratory sensitization; effects will be mediated locally due to the corrosive/irritant properties of the substance

Germ cell mutagenicity

Based on available data, the classification criteria are not met

No indication of mutagenicity when tested *in vitro* in the Bacterial Reverse Mutation Assay and *in vivo* using the Micronucleus Assay.

Carcinogenicity:

Based on available data, the classification criteria are not met

No evidence of carcinogenicity was seen in a study with read-across substance ammonium sulphate. An investigative study suggests that long-term exposure to drinking water containing ammonia (aqueous ammonia) may cause irritant gastritis which in turn may promote gastric carcinogenesis initiated by MNNG (N-methyl-N'-nitro-N-nitrosoguanidine). However there is no evidence that ammonia is carcinogenic.

Method: OECD Guideline 452

Species: rat (common rodent)

Road of exposure: oral

Exposure time: 52 weeks chronic

Result: NOAEL: 350 mg/kg/day

Reproductive toxicity:

Based on available data, the classification criteria are not met

No evidence of reproductive effects was observed in reproductive screening and 2-generation reproductive toxicity studies with the ammonium salts diammonium phosphate and ammonium perchlorate, respectively. The physiological role of ammonia indicates that it is unlikely to be a reproductive toxin at relevant exposure levels

Effect on fertility

Method: OECD Guideline 422

Species: rat (common rodent)

Road of exposure: oral

Exposure time: 35 days

Result: NOAEL: 387mg/kg/day

Test substance: diammonium phosphate (read-across)

STOT – single exposure

Based on available data, the classification criteria are not met

STOT – repeated exposure

Based on available data, the classification criteria are not met

Method: OECD Guideline 422

Species: rat (male/female)

Road of exposure: oral

Exposure time: 35 days

Result: NOAEL: 250 mg/kg/day

Test substance: diammonium phosphate (read-across) ■

Aspiration hazard

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


11.2 Information on other hazards

Endocrine disrupting properties - Data lacking

SECTION 12: ECOLOGICAL INFORMATION	
12.1 Toxicity	
Acute (short-term) toxicity:	
Fish:	LC ₅₀ for freshwater fish (rainbow trout ,96h, ammonium chloride): 0.89 mg/L un-ionised ammonia
Invertebrates:	EC ₅₀ /LC ₅₀ for freshwater invertebrates (daphnia magna, 48h): 101 mg/L
Acute (long- term) toxicity:	
Fish:	The lowest concentration of un-ionised ammonia at which long-term effects were found is 0.022 mg/L (NH ₃), 73 days, rainbow trout, ammonium chloride
Invertebrates:	EC ₁₀ /LC ₁₀ or NOEC for freshwater invertebrates (daphnia magna) : 0.79 mg/L EPA OPPTS 850.1300, read-across (analogy)
Other organisms:	
Algae/aquatic plants:	EC ₅₀ /LC ₅₀ for freshwater algae (18 days): 2700 mg/L
Sediment organisms:	Ammonia does not accumulate in sediments.
12.2 Persistence and degradability	
Not considered to be persistent and is rapidly biodegradable in aquatic systems. In abiotic environments, Ammonia is assimilated by aquatic algae and macrophytes for use as a nitrogen source.	
12.3 Bioaccumulative potential	
The accumulation of ammonia in biota is not considered of importance in the environment as it does not accumulate in lipid-rich tissues in the same manner as organic chemicals. Ammonia is ubiquitous in the aquatic environment due to the breakdown of plant and animal material and due to animal excretory processes. As a product of normal metabolism, Ammonia is not expected to bioaccumulate.	
12.4 Mobility in soil	
There is limited mobility in soil expected due to the strong adsorption of ammonium ions to clay minerals and the bacterial oxidation to nitrate. Ammonia in soil is in dynamic equilibrium with nitrate and other substrates in the nitrate cycle.	
12.5 Results of PBT and vPvB assessment	
According to the results of the assessment, the substance is not PBT or vPvB	
12.6 Endocrine disrupting properties - Data lacking	
12.7 Other adverse effects - Very toxic to aquatic life with long lasting effects.	
SECTION 13: DISPOSAL CONSIDERATIONS	
13.1 Waste treatment methods	Waste must be disposed of in line with local regulations and should not be discharged to surface water without prior treatment by STP.
13.1.1 Product / Packaging disposal:	Empty containers can contain vapours, do not drill cut, grind or weld. Use only approved transporters, recyclers and treatment, storage or disposal facilities. This material and/or its container must be disposed of as hazardous waste. It must not be released to the atmosphere Please follow all national and international laws. Waste codes / waste designations according to LoW: 16 05 04* - gases in pressure containers (including halons) containing dangerous substances. 15 01 10* - packaging containing residues of or contaminated by dangerous substances.

13.1.2 Waste treatment-relevant information:	Waste packaging should be collected and stored separately on specified and identified places. They should be delivered to the authorized companies for treatment.
13.1.3 Sewage disposal-relevant information:	Contaminated water should not be disposed of by discharge into sewage systems, water sources, soil or groundwater.
13.1.4 Other disposal recommendations:	Return the gas cylinders and unused product to the supplier.

SECTION 14: TRANSPORT INFORMATION

UN number ADR/RID/IMDG	UN 1005
14.2 UN proper shipping name ADR/RID/IMDG	AMMONIA, ANHYDROUS
<p>▣ V12 14.3 Transport hazard class ADR/RID/IMDG Label</p> <p>ADR/RID Class Classification code Hazard identification number</p> <p>IMDG EmS codes</p>	 <p>2.3 Toxic gases 8 Corrosive substances Environmentally hazardous substances 13 (RID)</p> <p>2 2TC 268</p> <p>F-C, S-U▣</p>
14.4 Packing group	Not applicable
14.5 Environmental hazard ADR/RID/IMDG	hazardous
14.6 Special precautions for users	The person transporting the product must be trained and know how to respond to an accident or spillage
14.7 Maritime transport in bulk according to IMO instruments	Not applicable

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulation/ legislation specific for the substance or mixture:	<p>Regulation EC 1907/2006 (REACH), Regulation EC 1272/2008 (CLP), Directive 98/24 EC, Directive 2012/18/EU (Seveso III), Quantity 1) 50 t; Quantity 2) - 200 t</p> <p><u>* Regulations / legislation and amendments to the date of issue of the document are indicated</u></p>
15.2 Chemical safety assessment:	In accordance with REACH Article 14, a Chemical Safety Assessment has been carried out for this substance.

SECTION 16: OTHER INFORMATION

Indication of changes: Changes of the last version are highlighted with **■ V12 ...■**. This version replaces all previous versions.

List of exposure scenarios (ES)*:

ES 15: Distribution and formulation of anhydrous ammonia

ES 16: Industrial end-use of anhydrous ammonia in industrial cooling systems

ES 19: Industrial use of anhydrous ammonia as an intermediate

ES 1: Industrial end-use of anhydrous ammonia (heat transfer fluid, e.g., refrigerating, cooling/heating systems)

ES 2: Industrial end-use of anhydrous and aqueous ammonia (chemical/process nutrient, e.g., pharmaceuticals, food, biofuel)

ES 3: Industrial end-use of anhydrous and aqueous ammonia (flue gas NO_x and SO_x reduction)

ES 4: Industrial end-use of anhydrous and aqueous ammonia (part of specialist chemicals/other products, (e.g., photochemical)

ES 5: Industrial end-use of anhydrous and aqueous ammonia (processing, non-processing aids, auxiliary agent)

ES 6: Industrial end-use of anhydrous and aqueous ammonia (reactive agent/processing aid and for general chemical applications, e.g., extraction, water treatment/septicity control, pH/neutralising agent)

ES 7: Industrial end-use of anhydrous and aqueous ammonia (surface/article treatment, e.g., metal, leather/textiles, plastics, wood, electronics/semiconductors, insulation, hardening, etchant)

ES 8: Wide dispersive end-use: Professional uses of anhydrous and aqueous ammonia (formulation o mixtures)

ES 9: Wide dispersive end-use: Professional uses of anhydrous and aqueous ammonia (heat transfer fluid, e.g., refrigeration, cooling/heating systems)

ES 10: Wide dispersive end-use: Professional uses of anhydrous and aqueous ammonia (laboratory/research chemical)

ES 11: Wide dispersive end-use: Professional uses of anhydrous and aqueous ammonia (reactive agent/processing aid, general chemical applications, e.g., pH/neutralising agent, water treatment)

ES 12: : Wide dispersive end-use: Professional uses of anhydrous and aqueous ammonia (surface/article treatment, e.g., metal, textiles/leather, plastics, wood, etching concrete)

* Depending on your identified use, the relevant CE will be provided

Classification in accordance with Regulation 1272/2008 (CLP)

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 Very toxic to aquatic life

H411 Toxic to aquatic life with long lasting effects.

EUH 071 Corrosive to the respiratory tract

List of abbreviations

PBT – persistent, bioaccumulative and toxic

vPvB - very persistent and very bioaccumulative

NOAEL - no observed adverse effect level

NOAEC - no observed adverse effect concentration

DNEL - derived no-effect level

PNEC - predicted no-effect concentration

PEC - predicted environmental concentration

LOEC - lowest observed effect concentration

NOEC - no observed effect concentration

OECD - Organization for Economic Cooperation and Development

LC_x - lethal concentration

EC_x - effective concentration

LD_x - lethal dose

■V13 Key sources of data

Chemical safety report 2023, Anhydrous Ammonia, FARM REACH Consortium■

The information above is on the basis of our knowledge about the product and represents the data currently available to us at the moment of safety data sheet issue. This document is intended as guidance for the appropriate precautionary handling with the product by a properly trained person using this product, and does not legally bind in no way manufacturer with guarantee for specific properties, qualities and applications. Neochim PLC does not grant, guarantee or implies any warranties of merchantability, fitness for a particular purpose with respect to the information set forth herein or the product to which the information refers. Neochim PLC does not carry any liability for damages resulting from the product use or reliance upon this information, data and recommendations for it. Users are responsible to make their own investigations to determine the suitability of the information and the product for their particular purposes, and to comply with applicable laws.