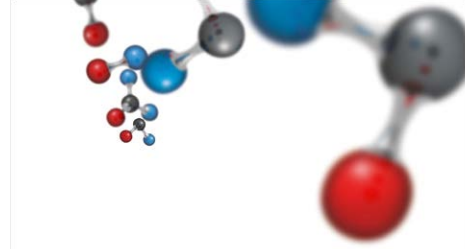


SAFETY DATA SHEET (SDS)

AMMONIA (ANHYDROUS)



Compilation: 30.11.2010
Revision number: 1
Revision: 03.02.2016
Version: 2.0

SECTION 1 Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Substance name: **AMMONIA, ANHYDROUS**
Product name: **AMMONIA (ANHYDROUS)**
Index number: 007-001-00-5
EC number: 231-635-3
CAS number: 7664-41-7
CAS name: Anhydrous ammonia
IUPAC name: ammonia
REACH registration number: 01-2119488876-14-0051

Type of substance:

Composition: mono constituent substance
Origin: inorganic

1.2. Relevant identified uses of the substance or mixture

Fertilizers, intermediates. Starting material for inorganic synthesis, raw material of artificial fertilizers and is fertilizer in itself, working medium in coolers, etc.

Note: See Section 16 for a complete list of uses for which an ES (Exposure Scenario) is provided as an annex.

1.2.1. **Uses advised against:** The use of the substance should be limited to those specified in ES.

1.3. Details of the supplier of the safety data sheet

Company identification:

BorsodChem Zrt.

H-3700 Kazincbarcika

Bolyai tér 1.

Phone: +36 48 511 211 (0-24)

Other comments:

Language(s) of the phone service: Hungarian, English.

E-mail of responsible person for SDS: sds@borsodchem.eu

1.4. Emergency telephone number

SGS Emergency Response Services

Phone: +32 3 575 55 55 (International, 0-24)

Asia Pacific: +800 ALERTSGS [+800-2537-8747] (free of charge, 0-24)

+65-6542-9595 (Singapore, 0-24)

Health Toxicological Information Service (HTIS) (Hungary)

Phone: 06 80 201 199 (green number, free of charge, 0-24)

+36 1 476 6464 (0-24)

Other comments:

Language(s) of the phone service: Hungarian, English.

National Poisons Information Service (NPIS) (England, Wales)

Phone: 111 (0-24 h)

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SECTION 2 Hazards identification

- 2.1 Classification of the substance or mixture
2.1.1 Classification according to Regulation (EC) No 1272/2008 (CLP)

Hazard classes / categories	Hazard statement	Remarks
Flam. Gas 2	H221 Flammable gas.	
Press. Gas	H280 Contains gas under pressure; may explode if heated.	
Skin Corr. 1B	H314 Causes severe skin burns and eye damage.	
Acute Tox. 3	H331 Toxic if inhaled.	
Aquatic Acute 1	H400 Very toxic to aquatic life.	M-Factor: 1

Specific concentration limits

Concentration range (%): ≥ 25
Hazard categories: Aquatic Acute 1

Concentration range (%): ≥ 5
Hazard categories: Skin Corr. 1B
STOT SE 3

Concentration range (%): $\geq 1 - < 5$
Hazard categories: Skin Irrit. 2

2.2. Label elements

2.2.1. Labeling according to Regulation (EC) No 1272/2008 (CLP)

Product name: AMMONIA (ANHYDROUS)
Substance: AMMONIA, ANHYDROUS
Index No: 007-001-00-5

Hazard pictograms:



GHS04



GHS05



GHS06



GHS09

Signal word: DANGER

Hazard statements:

H221 Flammable gas.
H280 Contains gas under pressure; may explode if heated.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.
H400 Very toxic to aquatic life.

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AMMONIA (ANHYDROUS)

Precautionary statements:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P501	Dispose of contents/container to hazardous or special waste collection point.

Supplemental Hazard information (EU):

EUH071 Corrosive to the respiratory tract.

Note:

Note U

2.3. Other hazards

The substance does not meet the criteria for persistent, bioaccumulation and toxicity (PBT) or the criteria for Very Persistent and Very Bioaccumulative (vPvB) in accordance with Annex XIII of 1907/2006/EC.

SECTION 3 Composition/information on ingredients

3.1. Substance

Chemical name	EC number	CAS number	Index number	REACH Registration number	Concentration % (w/w)
Anhydrous ammonia	231-635-3	7664-41-7	007-001-00-5	01-2119488876-14-0051	> 99.5

SECTION 4 First aid measures

4.1. Description of first aid measures

Obtain immediately medical attention in every case.

4.1.1. **In case of inhalation:** Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer artificial respiration if patient is not breathing.

4.1.2. **In case of skin contact:** Immediately flush exposed area with copious amounts of water for at least 15 minutes followed by washing area thoroughly with soap and water. Remove contaminated clothing. The patient should be seen in a health care facility if irritation or pain persists.

Caution: Clothing frozen to the skin should be thawed before being removed.

4.1.3. **In case of eye contact:** Immediately flush eyes with copious amounts of water for at least 15 minutes. 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.

4.1.4. **In case of ingestion:** Call a physician. If conscious, give the patient milk or water to drink immediately. Do not induce vomiting.

4.1.5. **Information to physician:** Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention.

4.2. **Most important symptoms and effects, both acute and delayed:** The substance is corrosive to the eyes, the skin and the respiratory tract. Inhalation of high concentrations may cause lung oedema. Rapid evaporation of the liquid may cause frostbite.

4.3. **Indication of any immediate medical attention and special treatment needed:** The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation is therefore essential. Immediate administration of an appropriate inhalation therapy by a doctor or a person authorized by him/her, should be considered.

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AMMONIA (ANHYDROUS)

SECTION 5 Firefighting measures

- 5.1. **Extinguishing media**
Suitable extinguishing media: Stopping the flow of gas rather than extinguishing the fire is usually the best procedure to follow when escaping gas is burning. Dry chemical or CO₂, water spray, fog or foam.
Unsuitable extinguishing media: Tight water jet is not recommended.
- 5.2. **Special hazards arising from the substance or mixture:** Use of open flame or smoking is prohibited.
- 5.3. **Advice for firefighters**
Special protective equipment: Positive pressure self-contained breathing apparatus (SCBA) should be used when there is a potential for inhalation of vapours and/or fumes. Chemical protective clothing that is safe for use with ammonia involved in a fire should be worn.
Further information: 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. Isolate area until gas has dispersed. Use water spray or foam to control vapour.
Fire hazard class in Hungary: explosive.

SECTION 6 Accidental release measures

- 6.1. **Personal precautions, protective equipment and emergency procedures**
- 6.1.1. **Advice for non-emergency personnel:** Stop leak if you can do so without risk. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.
- 6.1.2. **Advice for emergency responders:** Keep non-affected 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 firefighter's protective clothing used in conjunction with water spray will provide limited protection in outdoor releases for short-term exposure.
Fully encapsulating, vapour-protective clothing should be worn for spills and leaks with no fire. Use water spray or foam to control vapours. 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.
- 6.2. **Environmental precautions:** Avoid release to the environment. Close up danger area, notify authorities. Close leaking spots, if it is possible without human risks. Spilled ammonia should be closed round.
- 6.3. **Methods and material for containment and cleaning up:** The spill should be soaked up with suitable absorbent, like dry earth or sand and removed in closed container to safe disposal site. Residual material should be washed up with water.
- 6.4. **Reference to other sections:** See section 1 for emergency contact information and section 13 for waste disposal. Put on appropriate personal protective equipment: see section 8.

SECTION 7 Handling and storage

- 7.1. **Precautions for safe handling**
When handling the substance wear of means of personal protection is compulsory. Transloading and similar operations shall be made in closed system. There is a danger of electrostatic charge accumulation.
- 7.2. **Conditions for safe storage, including any incompatibilities**
In pressurized steel vessels. Storage vessels shall be provided with pressure gauge and safety valve. Electrical accessories shall be of explosion proof design.
- 7.3. **Specific end use(s):** Not applicable.

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AMMONIA (ANHYDROUS)

SECTION 8 Exposure controls/personal protection

Significant routes of exposure:

Human exposure: by inhalation.

Environmental exposure: air.

Pattern of exposure: accidental/infrequent.

The recommended control strategies:

1. Employ good industrial hygiene practice.
2. Use local exhaust ventilation.
3. Enclose the process.
4. Seek the advice of a specialist.

8.1. Control parameters

8.1.1. Occupational Exposure Limits

Substance name: **Ammonia**
CAS number: **7664-41-7**

Countries	Limit value (8 hours)		Limit value (short term)	
	ppm	mg/m ³	ppm	mg/m ³
Austria	20	14	50	36
Belgium	20	14	50	36
Denmark	20	14	40	28
European Union	20	14	50	36
France	10	7	20	14
Germany	20	14	40	28
Hungary		14		36
Italy	20	14	50	36
Latvia	20	14	50	36
Poland		14		28
Spain	20	14	50	36
Sweden	20	14	50	36
Switzerland	20	14	40	28
The Netherlands		14		36
United Kingdom	25	18	35	25

Source: <http://limitvalue.ifa.dguv.de>

8.1.2. DNEL/PNEC-values

Workers:

Acute/short-term exposure - systemic effects (dermal):

DNEL = 68 mg/kg bw/day

Acute/short-term exposure - systemic effects (inhalation):

DNEL = 47.6 mg/m³

Acute/short-term exposure - local effects (dermal):

Not applicable.

Acute/short-term exposure - local effects (inhalation):

DNEL = 36 mg/m³

Long term exposure - systemic effects (dermal):

DNEL = 68 mg/kg bw/day

Long term exposure - systemic effects (inhalation):

DNEL 47.6 mg/m³

Long-term exposure - local effects (dermal):

Not applicable.

Long-term exposure - local effects (inhalation):

DNEL = 14 mg/m³

General population:

Acute/short-term exposure - systemic effects (dermal):

DNEL = 68 mg/kg bw/day

Acute/short-term exposure - systemic effects (inhalation):

DNEL = 23.8 mg/m³

Acute/short-term exposure - systemic effects (oral):

DNEL = 6.8 mg/kg bw/day

Acute/short-term exposure - local effects (dermal):

Not applicable.

Acute/short-term exposure - local effects (inhalation):

DNEL = 7.2 mg/m³

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AMMONIA (ANHYDROUS)

Long term exposure - systemic effects (dermal):	DNEL = 68 mg/kg bw/day
Long term exposure - systemic effects (inhalation):	DNEL = 23.8 mg/m ³
Long term exposure - systemic effects (oral):	DNEL = 6.8 mg/kg bw/day
Long-term exposure - local effects (dermal):	Not applicable.
Long-term exposure - local effects (inhalation):	DNEL = 2.8 mg/m ³

PNEC aqua (freshwater):	0.0011 mg/l
PNEC aqua (marine water):	0.0011 mg/l
PNEC aqua (intermittent releases):	0.0068 mg/l

PNEC STP: Ammonia is utilised as a nitrogen source by bacteria and is also produced by bacteria as a breakdown product of other nitrogenous compounds. The derivation of a PNEC STP is therefore not required.

PNEC sediment (freshwater, marine water): Ammonia does not accumulate in sediments. The derivation of a PNEC STP is therefore not required.

PNEC oral: There is no evidence that ammonia bioaccumulates, the derivation of PNECs to protect against secondary poisoning is not required.

8.2. Exposure controls

8.2.1. **Appropriate engineering controls:** Exposure should be limited using appropriate engineering controls (containment, Local Exhaust Ventilation) and protective equipment (safety gloves, goggles, 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.

8.2.2. Individual protection measures

8.2.2.1. **Eye/Face protection:** Use chemical 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.

8.2.2.2. Skin and body protection

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 gloves, ammonia resistant clothing (overalls, jacket, and boots) or vapor suit, as required.

Hand protection: Alkaline resistant gloves.

8.2.2.3. **Respiratory protection:** Gas mask equipped with "K" filter, or self-contained breathing apparatus.

8.2.2.4. **General safety and hygiene measures:** Wearing of closed work clothing is required and additionally to the stated personal protective equipment. Keep away from drink, food and animal feeding stuffs. No eating, drinking, smoking or tobacco use at the place of work. Take off immediately all contaminated clothing. Hands and face should be washed before breaks and at the end of shift. At the end of the shift the skin should be cleaned and skin-care agents applied.

8.2.3. **Environmental exposure controls:** In accordance with local and national regulations.

SECTION 9 Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance:

Physical state: gas (at 20°C, 1013 hPa)

Colour: colourless

Odour: ammonia-like

Odour threshold: No data.

pH: Not applicable.

Melting point/freezing point: -78°C (at 1013 hPa)

Initial boiling point and boiling range: -33°C (at 1013 hPa)

Flash point: Not applicable. This endpoint is waived in accordance with Column 2 of Annex VII of the REACH as the substance is an inorganic gas.

Evaporation rate: No data.

Flammability: Flammable gas.

Upper/lower flammability or explosive limits:

Lower explosion limit is: 16%

Upper explosion limit is: 25%

Vapour pressure: 8611 hPa (at 20°C)

Vapour density: No data.

Relative density: Not relevant for gas.

Solubility: 510-531 g/l (at 20°C)

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Partition coefficient: n-octanol/water: Not applicable. This endpoint is waived in accordance with Column 2 of Annex VII of the REACH Regulation, as the substance is inorganic.

Auto-ignition temperature: 651°C (at 1013 hPa)

Decomposition temperature: Hydrogen is released on heating above 454°C.

Viscosity: The substance is a gas at room temperature: this endpoint is not relevant. However the viscosity of anhydrous ammonia was measured to 0.475, 0.317, 0.276 and 0.255 cP at -69, -50, -40 and -33.5°C respectively.

Explosive properties: Non explosive.

Oxidising properties: Not applicable.

9.2. Other information

Surface tension: Not applicable. This endpoint is waived in accordance with Column 2 of Annex VII of the REACH as the substance is a gas at room temperature.

Granulometry: Not applicable. This endpoint is waived in accordance with Column 2 of Annex VII of the REACH Regulation, as the substance is a gas.

Oxidation reduction potential: -3.09 V (at 20°C). Anhydrous ammonia is a strong reducing agent.

Stability in organic solvents and identity of relevant degradation products: Not applicable. This endpoint is waived in accordance with Column 2 of Annex VII of the REACH as the substance is inorganic.

Dissociation constant: pKa = 9.25 (at 25°C)

SECTION 10 Stability and reactivity

- 10.1. **Reactivity:** Atmospheric ammonia reacts with ozone, hydroxyl radical, and atomic oxygen.
- 10.2. **Chemical stability:** This is a stable material; hazardous polymerisation will not occur.
- 10.3. **Possibility of hazardous reactions:** 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:** Keep away from heat and ignition sources.
- 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, coloured metals (e.g. copper, aluminum, etc.).
- 10.6. **Hazardous decomposition products:** Hydrogen.

SECTION 11 Toxicological information

11.1. Information on toxicological effects

11.1.1. Acute toxicity

Acute toxicity – oral:

Rat (male) LD50 = 350 mg/kg bw

Method: OECD Guideline 401

(Read across ammonium hydroxide (aqueous ammonia) – CAS 1336-21-6)

Acute toxicity – inhalation

Rat (male) LC50 = 9850 mg/m³ air (1 h)

Rat (female) LC50 = 13770 mg/m³ air (1 h)

Method: Other guideline.

Acute toxicity – dermal: Data waiving. 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. Not classified.

11.1.2. Skin corrosion/irritation

Rabbits Corrosive. (12%, 4 h)

Method: OECD Guideline 404

(Read across ammonium hydroxide (aqueous ammonia) – CAS 1336-21-6)

11.1.3. Serious eye damage/irritation

Anhydrous ammonia causes severe skin burns and eye damage.

11.1.4. Respiratory or skin sensitization: Not classified.

11.1.5. Germ cell mutagenicity

Gene mutation, in vitro:

E. coli Negative.

Method: Other guideline.

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AMMONIA (ANHYDROUS)

- Chromosome aberration, in vivo:
Mouse (male) Negative.
Method: OECD Guideline 474
- 11.1.6. **Carcinogenicity**
Mice (oral, male/female) Negative.
Method: Other guideline.
- 11.1.7. **Reproductive toxicity**
Rats (oral, male/female) NOAEL = 1500 mg/kg/day (35 days, daily)
LOAEL > 1500 mg/kg/day (35 days, daily)
Method: OECD Guideline 422
(Read across diammonium phosphate – CAS 7783-28-0)
- 11.1.8. **STOT-single exposure:** No data.
- 11.1.9. **STOT-repeated exposure**
Rats (oral) NOEL = 886 mg/kg bw/day (male) (90 days)
NOEL = 1975 mg/kg bw/day (female) (90 days)
Method: OECD Guideline 408
(Read across ammonium sulphate – CAS 7783-28-0)
- 11.1.10. **Aspiration hazard:** Not classified due to lack of data.

SECTION 12 Ecological information

- 12.1. **Toxicity**
- 12.1.1. **Aquatic toxicity**
Short-term toxicity to fish:
Freshwater fish (*Oncorhynchus gorboscha*) LC50 = 0.068 mg/l (96 h, ammonia)
Method: Other guideline.
Long-term toxicity to fish:
Freshwater fish (*Oncorhynchus mykiss*) LOEC >= 0.05 mg/l (33 days, ammonia)
Method: Other guideline.
Short-term toxicity to aquatic invertebrates:
Freshwater invertebrates (*Daphnia magna*) LC50 = 101 mg/l (48 h)
Method: ASTM E729-80
Long-term toxicity to aquatic invertebrates:
Freshwater invertebrates (*Daphnia magna*) NOEC = 0.79 mg/l (96 days)
Method: EPA OPPTS 850.1300
Toxicity to aquatic algae and cyanobacteria:
Freshwater algae (*Chlorella vulgaris*) EC50 = 2700 mg/l (18 days)
Method: Other guideline.
- 12.2. **Persistence and degradability**
Phototransformation in air: Ammonia reacts with ozone, hydroxyl radical, and atomic oxygen. Oxidation by ozone is a first order reaction with respect to the concentration of ammonia and is catalyzed by hydroxide ions over the pH range 7-9. Ammonia and ozone react to produce ammonium nitrate aerosols. Photolytic degradation and reaction with photolytically produced hydroxyl radicals ($\cdot\text{OH}$) in the troposphere are major pathways for the removal of atmospheric ammonia.
Method: Other guideline.
Hydrolysis: Ammonia will not hydrolyse. The substance is highly soluble in water and will be present in an equilibrium as ammonia and the ammonium ion. The balance of the equilibrium will be influenced by concentration and pH, however the ammonium ion will be predominant at relevant pH and low concentrations.
Biodegradation in water: Ammonia is rapidly biodegraded in the environment.
Biodegradation in soil: Ammonia is rapidly biodegraded in soil.
Method: Other guideline.
- 12.3. **Bioaccumulative potential**
Ammonia does not bioaccumulate and is a product of normal metabolism.
- 12.4. **Mobility in soil**
Adsorption/desorption: Ammonia is strongly adsorbed on soil, sediment particles and colloids in water.
Method: Other guideline.
Volatilisation:
Henry's Law Constant $1.6 \cdot 10^{-5} \text{ atm}\cdot\text{m}^3/\text{mol}$ (25°C)
Method: Other guideline.

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12.5. Results of PBT and vPvB assessment

The substance does not meet the criteria for persistent, bioaccumulation and toxicity (PBT) or the criteria for Very Persistent and Very Bioaccumulative (vPvB) in accordance with Annex XIII of 1907/2006/EC.

12.6. Other adverse effects

It is not expected that substance has an effect on global warming, ozone depletion in the stratosphere or ozone formation in the troposphere.

Secondary poisoning: Based on the available information, there is no indication of a bioaccumulation potential and, hence, secondary poisoning is not considered relevant. Exposure to birds is not expected.

SECTION 13 Disposal considerations

13.1. Waste treatment methods

Waste must be disposed of in line with local regulations and ammonia solution should not be discharged to surface water without prior treatment by Sewage Treatment Plant (STP).

Release to the environment or sewage system is prohibited. Shall be treated as hazardous waste.

13.1.1. Contaminated packaging

Packaging materials may be re-used after decontamination.

13.1.2. Waste treatment options: Incinerate in suitable incineration plant, observing local authority regulations.

SECTION 14 Transport information

Land transport (ADR/RID/GGVSE)

Marine transport (IMDG-Code/GGVSee)

Air transport (ICAO/IATA/DGR)

- | | | |
|-------|---|--------------------|
| 14.1. | UN number: | 1005 |
| 14.2. | UN proper shipping name: | AMMONIA, ANHYDROUS |
| | Language: English | |
| 14.3. | Transport hazard class(es): | 2 |
| | Classification code: | 2TC |
| 14.4. | Packing group | |
| | Labels: | 2.3+8 |
| 14.5. | Environmental hazards: | Yes. |
| | Marine pollutant: | No. |
| 14.6. | Special precautions for users | |
| | EmS number: | F-C, S-U |
| 14.7. | Transport in bulk according to Annex II of MARPOL and the IBC Code: | Not relevant. |

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AMMONIA (ANHYDROUS)

SECTION 15 Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Ammonia is found in Annex I of Directive 2012/18/EU (Seveso III). Qualifying quantity for dangerous substance for the application of

Lower-tier requirements: 50 tonnes,
Upper-tier requirements: 200 tonnes.

15.1.1. EU regulations

- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.
- REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
- Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.
- International Chemical Safety Cards (WHO/IPCS/ILO)

15.1.2. Hungarian regulations

- Act XXV of 2000 on Chemical Safety
- Decree No. 44/2000 (27 Dec) of EüM (Ministry of Health) on the detailed regulation of some processes and activities applied to treat hazardous substances and preparations
- Decree No. 25/2000 (30 Sept) EüM-SZCSM (Ministry of Health - Ministry of Social and Family Affairs) on the chemical safety of workplaces
- Decree No. 72/2013 (27 Aug) of KöM (Ministry of Environment Protection) on the register of wastes
- Act LXXXIX of 2015 on the publication of standardization of the texts for the amendments and supplements of 2015 to annexes A and B of ADR (International Carriage of Dangerous Goods by Road by the European Agreement) in a harmonized system
- Act CIX of 2013 of 9 May 1980, in Bern, on the publication of standardization of the texts for the amendment of COTIF (Convention on International Carriage by Rail) accepted in Vilnius and the amendments and supplements of 2013 to annex of Appendix C of the Protocol of 3 June 1999 in a harmonized system.
- 98/2001. (VI. 15.) Government Decree on the conditions of execution for activities related to hazardous waste.

15.2. **Chemical safety assessment:** Chemical Safety Assessment has been carried out for the substance by the supplier.

SAFETY DATA SHEET (SDS)

AMMONIA (ANHYDROUS)

SECTION 16 Other information

16.1. Indication of changes

This version replaces all previous versions.
Amendments have been made to Safety Data Sheet Version 1.0 in sections 1-16.

16.2. Abbreviations and acronyms

Acute Tox.: Acute Toxicity
Aquatic Acute: Hazardous to the aquatic environment (acute)
bw: bodyweight
CAS number, name: Chemical Abstracts Service number, name
CLP: Classification Labelling Packaging Regulation
DNEL: Derived No Effect Level
EC: European Commission
EC number: EINECS and ELINCS number
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
ES: Exposure scenario
Flam. Gas: Flammable gas
IUPAC: International Union of Pure and Applied Chemistry
LC50: Lethal concentration, 50%
LD50: Median Lethal dose
LOAEL: Lowest observed adverse effect level
NOAEL: No observed adverse effect level
NOEC: No Observed Effect Concentration
PBT: Persistent, Bioaccumulative and Toxic
PC: Chemical Product Category
PNEC: Predicted No Effect Concentration
Press. Gas: Gases under pressure
PROC: Process category
REACH: The Registration, Evaluation, Authorisation and restrictions of Chemicals
Skin Corr.: Skin corrosion
Skin Irrit.: Skin irritation
STOT: Specific Target Organ Toxicity
STOT SE: Specific Target Organ Toxicity - single exposure
STP: Sewage Treatment Plant
vPvB: Very Persistent and Very Bioaccumulative

16.3. **Key literature references and sources for data:** Registration dossier for Ammonia (EC 231-635-3).

16.4. **Classification for substances and used evaluation method according to Regulation (EC) 1272/2008 (CLP):**

Classification according to Regulation (EC) 1272/2008	Classification procedure
Flam. Gas 2	Minimum classification.
Press. Gas	On basis of test data.
Skin Corr. 1B	On basis of test data.
Acute Tox. 3	On basis of test data.
Aquatic Acute 1	On basis of test data.

16.5. **Relevant H- and P-phrases**

H-phrases:

H221 Flammable gas.
H280 Contains gas under pressure; may explode if heated.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.
H400 Very toxic to aquatic life.

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P-phrases:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P501	Dispose of contents/container to hazardous or special waste collection point.

16.6. Generic list of applications (Exposure Scenarios)

- ES1:** Manufacturing of anhydrous ammonia (PROC 1, PROC 2, PROC 8a, PROC 8b)
ES2: Distribution and formulation of anhydrous ammonia (PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 15)
ES3: Industrial uses of anhydrous ammonia as an intermediate (PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 15)
ES4: Industrial end-use of anhydrous and aqueous ammonia (processing, non-processing aids, auxiliary agent) (PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 13, PROC 15, PROC 19)
ES5: Wide dispersive end-use: Professional uses of anhydrous and aqueous ammonia (PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 11, PROC 13, PROC 15, PROC 18, PROC 19)
ES6: Wide dispersive end-use: Consumer uses of aqueous ammonia (PC 9a, PC 9b, PC 9c, PC1, PC 12, PC 16, PC 18, PC 20, PC 23, PC 35, PC 37, PC 39)

Annex 1: Exposure Scenario (ES)

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Safety Data Sheet
AMMONIA (ANHYDROUS)

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This SDS is prepared for the purpose of providing health, safety and environmental data. The information given corresponds with our actual knowledge and experience. While the descriptions, data and information contained in the present datasheet are provided in good faith, these are to be considered as guidance only.

This information is meant to describe our product in view of possible safety requirements, but it remains the responsibility of the customer to determine the applicability of the information and suitability of any product for its own particular purpose, to provide a safe workplace and comply with all applicable laws and regulations.

Since handling, storage, use and disposal of the product are beyond our control and our knowledge, we do exclude any responsibility connecting to handling, storage, use or disposal of this product.

Please note that if the product used as a component of another product, this SDS information may not be applicable.

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