AS Nitrofert
MATERIAL SAFETY DATA SHEET
Ammonia, Anhydrous

Revised: February 08, 2008

N
Dangerous for environment

T
Toxic

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

1.1 Identification of the Product

Designation	*Ammonia, Anhydrous*
Commonly used synonyms	Ammonia, Liquid Ammonia, Liquified Ammonia, Anhydrous Ammonia..
CAS Number	7664-41-7
EINECS Number	231-635-3
EINECS Name	Ammonia, anhydrous
Molecular formula	NH3

1.2 Company

Name	AS Nitrofert
Address	AS Nitrofert Reg. 10160963, VAT No. EE100164723, Järveküla tee 1, 30197, Kohtla-Järve, Estonia
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1.3 Emergency calls **112**
in the territory of Estonia

2. COMPOSITION/INFORMATION ON INGREDIENTS

2.1 Nature of ingredients and concentration

Essentially pure ammonia containing minute levels of water (normally <1000ppm).

Ammonia, wt. %	min 99.6
Nitrogen, wt. %	min 82

Water (by volumetric method), %	0.2-0.4
Oil (wt. concentration), mg/dm^3	max 2
Iron (wt. concentration), mg/dm^3	max 1

Note: When transported in tank cars, it is admissible for anhydrous ammonia to have moisture content lower than 0.2%.

2.2 Classification

Toxic according to EEC classification

3. HAZARDS IDENTIFICATION

3.1 Human health

Ammonia is toxic by inhalation, corrosive to all parts of the body and liquid splashes can cause severe cold burns.

Skin Contact

Liquid ammonia splashes may produce severe cold burns to skin. Vapour in presence of moisture is an irritant to the skin.

Eye Contact

Liquid ammonia splashes may 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.

Ingestion

Will immediately cause severe corrosion of and damage to the gastro-intestinal tract.

Inhalation

Ammonia odour threshold 5-25ppm. Concentrations in the range 50-100ppm may cause slight irritation following prolonged exposure. Immediate eye, nose and throat irritation may occur with ammonia levels between 400-700ppm with symptoms of slight upper respiratory tract irritation persisting beyond the period of exposure. At higher concentrations, above 1000ppm, severe eye and upper respiratory tract irritation can develop following a short period of exposure. Exposure to ammonia in excess of 2000ppm for even short periods may result in severe lung damage and could be fatal. Fluid buildup on the lung (pulmonary oedema) may occur up to 48 hours after exposure and could prove fatal.

Exposure to concentrations grossly in excess of the occupational exposure limit may lead to permanent respiratory impairment.

Long term effects

No evidence of adverse effects at exposure below occupational exposure limits.

3.2 Environment

Ammonia is toxic to aquatic life.

3.3 Other

Fire, heating and explosion

Flammable but difficult to ignite in open air. In an enclosed space ammonia air mixtures may be flammable/explosive.

Danger of tank or cylinder bursting when heated.

Large leaks of liquid ammonia may produce a dense cloud, restricting visibility.

4. FIRST-AID MEASURES

4.1 Product

Speed is essential. Remove affected person from further exposure. Give immediate first aid and obtain medical attention.

Skin Contact

Drench with large quantities of water. In case of frost bite (freeze burns) clothing may adhere to the skin. Defrost with care using comfortable warm water.

Remove clothing and wash affected parts.

Obtain immediate medical attention.

Eye Contact

Immediately irrigate the eyes with eyewash solution or clean water for at least 10 minutes.

Continue irrigation until medical attention can be obtained.

Hold eyelids open during flushing.

Ingestion

Do not induce vomiting.

If the injured person is conscious, wash out mouth with water and give 2 or 3 glasses of water to drink.

Obtain immediate medical attention.

Inhalation

Move the injured person to fresh air at once.

Keep the patient warm and at rest.

Administer oxygen if competent person is available.

Apply artificial respiration, if breathing has stopped or shows sign of failing.

Obtain immediate medical attention.

Further medical advice

Keep under medical review for possibility of rapid or delayed tracheal, bronchial and pulmonary oedema.

Progressive ocular damage may arise.

5. FIRE-FIGHTING MEASURES

Ammonia vapour and liquid spills are difficult to ignite, particularly in the open air. In an enclosed space, mixtures of ammonia and air within the limits (15-28%), might cause explosion if ignited. Cold, dense cloud of ammonia may impair visibility.

Attempt to isolate source of leak.

Use foam, dry powder or CO_2.

Use water sprays to cool fire-exposed containers and structures, to disperse vapours and to protect personnel. ***Do not spray water into liquid ammonia.***

Wear self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Those dealing with major releases should wear full protective clothing including respiratory protection. See Section 8.

Evacuate the area down-wind of the release, if it is safe to do so.

If not, then stay indoors, close all windows and switch off any extraction fans or electrical fires.

Isolate source of leak as quickly as possible by trained personnel.

Ventilate area of spill or leak to disperse vapours.

Remove ignition sources.

Consider covering with foam to reduce evaporation.

Contain spillages if possible.

Use water sprays to combat gas clouds. Do not apply water directly into large ammonia spills.

Take care to avoid the contamination of watercourses.

Inform appropriate authority in case of accidental contamination of watercourses or drains.

7. HANDLING AND STORAGE

All safety measures to be strictly followed. The product is toxic and fire- and explosion hazardous.

7.1 Handling

Avoid skin and eye contact and inhalation of vapours.

Provide adequate ventilation.

Control atmospheric levels in compliance with occupational exposure limits.

Wear full protective equipment where there is a risk of leaks or splashes.

7.2 Storage

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

Keep away from heat, ignition sources and incompatible substances. (See Section 10.3.).

Do not permit smoking in the storage area.

Follow appropriate Industry or National codes for bulk and container (cylinder) storage.

7.3. R-Phrases; S-Phrases

R10	Flammable
R23	Toxic by inhalation
R-34	Causes burns.
R-50	Very toxic to aquatic organisms.
S7/9	Keep containers tightly closed and in a well-ventilated place
S16	Keep away from sources of ignition. No smoking.
S 26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S38 In case of insufficient ventilation wear suitable respiratory equipment.

S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S61 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Recommended occupational exposure limits

TLV/TWA : 20ppm = 14 mg/m^3 (Regulation No. 293 of the Government of Estonian Republic as of 18.09.2001).

TLV-STEL : 50ppm = 36 mg/m^3 (Regulation No. 293 of the Government of Estonian Republic as of 18.09.2001).

8.2 Precautionary and engineering measures

Provide local exhaust ventilation where appropriate.

Provide safety showers and eye washing facility at any location where skin or eye contact can occur.

8.3 Personal Protection

Wear suitable breathing apparatus if exposure levels exceed the recommended limits.

Wear cold insulating PVC gloves, rubber boots, PVC suit.

Use chemical safety goggles or full face shield.

9. PHYSICAL AND CHEMICAL PROPERTIES

Characteristics, which are relative to the change of the product's state:

Appearance	Colourless gas at ambient temperatures
Odour	Pungent, suffocating.
Freezing point	-78°C.
Boiling point	-33.4°C at 101.3kPa.
Explosive range, vol. % NH_3 in the air	15-28
Auto-ignition temperature	651°C.

Relative density (water = 1).	0.7 at -33.4°C
Solubility in water g/100 ml	Extremely soluble, e.g. 54 at 20°C.

10. STABILITY AND REACTIVITY

10.1 Stability

Thermally stable in reaction terms at design storage conditions. Heat input can cause liquid to vapourize.

10.2 Conditions to avoid

Physical damage and heating of containers.

10.3 Materials to avoid

Ammonia reacts violently with hypochlorites, mercury and halogens producing unstable compounds which are liable to explode.

Attacks copper, zinc, aluminium, cadmium and their alloys.

Reacts with mercury and silver oxide to form compounds that are sensitive to mechanical shock.

Ammonia gas can react violently with nitrogen oxides and strong acids.

10.4 Hazardous reactions/decomposition products

NOx from combustion.

11. TOXICOLOGICAL INFORMATION

11.1 General

Ammonia is toxic by inhalation and corrosive to all parts of the body.

11.2 Toxicity Data

Skin Contact

Vapour, in the presence of moisture, is an irritant to skin.

Liquid splashes or vapour spray can cause chemical or freeze burns.

Eye Contact

Low vapour concentrations can cause irritation and watering of eyes, higher concentrations (above 1000ppm) can cause severe damage.

Liquid splashes may cause permanent damage with the full effects not being apparent for several days.

Inhalation

Odour threshold is 5ppm for some and 25ppm for most people. At 50-100ppm irritation is experienced by most people.

Depending on ammonia vapour concentrations, exposure may cause immediate eye, nose and throat irritation, coughing, difficulty in breathing. At high concentrations exposure, even for short periods, may result in severe lung damage.

Pulmonary œdema may occur up to 48 hours after severe exposure and could prove fatal.

EEC classification: Toxic

(EEC Toxic criterion for gases and vapours:

Median Lethal Concentration - 4 hour exposure: 500 to 2000mg/m^3).

Exposure to concentrations greatly in excess of the occupational exposure limit may lead to permanent respiratory impairment.

Ingestion

Will immediately cause corrosion of and damage to gastro-intestinal tract.

11.3 Other Data

No adverse effect has been evaluated by IARC as regards carcinogenicity.

Ammonia is not mutagenic in Ames Salmonella test.

12. ECOLOGICAL INFORMATION

12.1 Mobility

Very soluble in water. NH_4+ ion is absorbed by soil.

12.2 Persistence/Degradability

In the soil, ammonia is quickly oxidized by microorganisms to nitrate ion.

In fresh water, it may be nitrified by microorganisms or adsorbed on sediment particles and colloids. Substantially biodegradable in water.

In the atmosphere, it may be degraded by photolysis or neutralised by acid pollutants of the air.

12.3 Bio-accumulation

Low potential.

12.4 Ecotoxicity

Free (non-ionised) ammonia in surface water is toxic to aquatic life; however, the ammonium ion which predominates in most waters is not toxic. In the event of water contamination with ammonia, ammonium salts which may be formed will not present a toxic hazard. Increases in pH above 7.5 leads to an increased level of non-ionized ammonia.

LC50 (96 hour) (various species) <1mg/l. Studies in fish have shown that repeated exposures produce adverse effects on growth rate at concentrations greater than 0.0024mg/l. EC50 (Daphnia magna) (48 hour) 24.4-189mg/l.

13. DISPOSAL CONSIDERATIONS

13.1 General

Disposal should be in accordance with local or national legislation.

14. TRANSPORT INFORMATION

14.1 UN Classification

Class 2 Gases, Division 2.3 Toxic Gas, UN No 1005.

14.2 Details

ADR/RID, Class 2, Item 3.(at), Label: 6.1.

IMDG, Class 2 (2.3) , Label 2.3 + Label subsidiary risk 8

15. REGULATORY INFORMATION

15.1 EC Directives

Classification and labelling according to Directive 67/548/EEC:

Classification T - Toxic, N – Dangerous for environment.

R10 Flammable

R23 Toxic by inhalation

R-34 Causes burns.

R-50 Very toxic to aquatic organisms.

S7/9 Keep containers tightly closed and in a well-ventilated place

S16 Keep away from sources of ignition. No smoking.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S38 In case of insufficient ventilation wear suitable respiratory equipment.

S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S61 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

15.2 National laws

Chemicals Act and legal acts and regulations pertinent thereto.

16. OTHER INFORMATION

The information is presented by:

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