

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Identifier:

Product Name: Ammonia Solution $\geq 10\% \leq \text{conc. to } \leq 35\%$.
Alternative names: Ammonia liquor, Ammonium hydroxide, Aqueous ammonia, Aqua ammonia.
Chemical Formula: $\text{NH}_4 \text{ OH}$.
CAS Number: 1336-21-6
EINECS Number: 215-647-6
REACH Registration Number: 01-2119488876-14 –XXXX

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

Identified use(s): See Section: 7.3
Uses advised against: The use of the substance should be limited to those specified in the CSR.

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Regulation (EC) No.1272/2008 (CLP): Skin Corr. 1B; Causes severe skin burns and eye damage.
 STOT SE 3; May cause respiratory irritation.
 Aquatic acute 1; Very toxic to aquatic life.

Label elements:

According to Regulation (EC) No. 1272/2008 (CLP):

Product Name: Aqueous Ammonia



Hazard Pictogram: GHS05 GHS07 GHS09

Signal Word(s): Danger.

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Hazard Statements: H314: Causes severe skin burns and eye damage.
H335: May cause respiratory irritation.
H400: Very toxic to aquatic life.

Precautionary Statements: P260, P264, P271, P273, P280, P312, P310, P321, P363 P391, P301 + P330 + P331, P303 + P361 + P353, P304 + P340, P305 + P351 + P338, P403 + P233, P405, P501.

Other hazards: Ammonia vapour is flammable in air in the range 16% - 25% v/v.

Additional information: For full text of H/P phrases see section 16.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Solution of ammonia in water. A clear colourless liquid evolving ammonia vapour.

Mixture:

EC Classification No. 1272/2008

Hazardous Ingredients(s)	%W/W	CAS No.	EC No.	REACH Registration No.	Hazard pictogram(s) and Hazard Statement(s)
Ammonia Solution	25 – 35	1336-21-6	215-647-6	01- 2119488876 -14-XXXX	GHS05, Skin Corr.1B;H314 GHS07, STOT SE 3; H335, GHS09, Aquatic Acute 1; H400.

Additional Information: For full text of H/P phrases see section 16.

4. FIRST AID MEASURES

Description of first aid measures:

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, give oxygen. If not breathing, give artificial resuscitation. Get medical attention immediately.

Skin contact: Immediately remove/take off all contaminated clothing and shoes. Flush skin with water for at least 15 minutes. Get medical attention immediately. Wash contaminated clothing and shoes before reuse.

Eye contact: Rinse cautiously with water for several minutes keeping eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Ingestion: Rinse mouth. Drink copious quantities of water. Do NOT induce vomiting. Get medical attention immediately.

Most important symptoms and effects, both acute and delayed: Following severe exposure the patient should be kept under medical review for at least 48 hours as delayed pulmonary oedema may develop.

Indication of any immediate medical attention and special treatment needed: Administer oxygen if necessary. In the case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for at least 48 hours.

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5. FIRE-FIGHTING MEASURES

Vapour: Combustible but not readily ignited.

Extinguishing Media:

Suitable Extinguishing Media: As appropriate for surrounding fire.

Unsuitable Extinguishing Media: None known.

Special hazards arising from the substance or mixture: Combustion or thermal decomposition will evolve toxic and irritant vapours.

Advice for fire-fighters: Notify police and fire brigade as soon as possible. Contain fire control water for later disposal. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep fire exposed containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel: Evacuate surrounding areas. Provided it is safe to do so, isolate the source of the leak. Wear appropriate personal protective equipment, avoid direct contact with vapour, mist or split material. Provide adequate ventilation, and wear appropriate respirator when ventilation is inadequate.

For emergency responders: If specialised clothing is required to deal with a release, take note of information in section 8 on suitable materials. See 'non-emergency personnel' above.

Environmental precautions: Avoid contact of spilt material and runoff with soil waterways, drains and sewers where possible. Spillages or uncontrolled discharges into watercourses must be alerted to the appropriate regulatory body.

Methods and material for containment and cleaning up:

Small release: Stop leak if without significant risk. Dilute with water and mop up, or absorb spillages onto sand, earth or any suitable adsorbent material and place in an appropriate waste container. Dispose of via licensed waste contractor.

Large release: Stop leak if without significant risk. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Use water spray to 'knock down' vapour. Wash spillages into an effluent treatment plant or proceed as follows. Contain or collect spillage with non-combustible, adsorbent material e.g., sand, earth, vermiculite or diatomaceous earth then place into container for disposal via a licensed waste disposal. Contaminated adsorbent material may pose the same hazard as the spilt product.

Reference to other sections: See section: 1 for emergency contact information.
See section: 13 for waste disposal.
See also section 8.

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7. HANDLING AND STORAGE

Precautions for safe handling: Use only outdoors or in a well-ventilated area. Do not breathe gas. Avoid contact with skin and eyes. Wear protective Gloves/protective clothing/eye protection/face protection. Wear appropriate respirator when ventilation is inadequate.

See also section: 8. Wash hands thoroughly after handling.

Conditions for safe storage, including any incompatibilities: Store locked up. Store in a well-ventilated place protected from direct sunlight. Keep container tightly closed. Keep away from: Acids. Use appropriate containment to avoid environmental contamination.

Storage Temperature: Ambient.

Storage Life: Stable under normal conditions.

Incompatible materials: Copper, copper alloy, Zinc, zinc alloy.

Appropriate packaging: Stainless steel, Mild steel, Polyethylene, Polypropylene.

Specific end use(s): Professional uses of anhydrous and aqueous ammonia Use as a laboratory chemical, refrigerant in cooling systems, water treatment chemical, fertiliser, coating, paint thinner or paint remover, photochemical. Professional uses of anhydrous and aqueous ammonia. Use as a cleaning product, pH regulatory or neutralisation agent, process aid for nutrition. Consumer use of aqueous ammonia. Use in coatings, paints, thinners and removers; use in fillers, putties and plasters, Use of washing and cleaning products, use in cosmetic & personal care products.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters:

Workplace Exposure Limit (UK HSE EH40)

Substance.	CAS Number	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note:
Ammonia	1336-21-6	25	18	35	25	EH40 WEL 10/2007

Biological limit value: Not established.

PNECs and DNELs: By analogy with similar materials: Anhydrous ammonia.

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DNEL	Oral	Inhalation	Dermal
Industry-Long Term-local effects	-	14.0 mg/m ³	-
Industry-Long Term-Systemic effects	-	47.6 mg/m ³	6.8mg/kgbw/day
Industry –Short Term-Local effects	-	36.0 mg/m ³	-
Industry-Short Term-Systemic effects	-	47.6mg/m ³	6.8mg/kgbw/day
Professional -Long Term-Local effects	-	-	-
Professional-Long Term-Systemic effects	-	-	-
Professional-Short Term-Local effects	-	-	-
Professional-Short Term- Systemic effects	-	-	-
Consumer – Long Term-Local effects	-	2.8mg/m ³	-
Consumer –Long Term – Systemic effects	6.8mg/kg bw/day	23.8mg/m ³	6.8mg/kgbw/day
Consumer – Short Term-Local effects	-	7.2mg/m ³	-
Consumer – Short Term-Systemic effects	6.8mg/kg bw/day	23.8mg/m ³	6.5mg/kgbw/day

PNEC

Aquatic Compartment (Fresh water)	0.0011 mg/l.
Marine Compartment	0.0011 mg/l.
Terrestrial Compartment	No Data.
Atmospheric Compartment	No Data.

Exposure controls:

Appropriate engineering controls: Use with local exhaust ventilation or breathing protection.

Personal protection equipment:

Eye/face protection: Goggles giving complete protection to eyes.

Skin protection (Hand protection/Other): Impervious gloves and boots: PVC, Butyl rubber.

Respiratory protection: A suitable respirator must always be worn. A suitable mask with Filter type K (EN141 or EN405) may be appropriate.

Thermal hazards: Not applicable.

Environmental Exposure Controls: Avoid release to the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Appearance:	Liquid
Colour:	Clear Colourless. (<5 Hazen Units).
Odour:	Pungent.
Odour Threshold (ppm):	Detectable to most people at levels as low as 5ppm.
pH (Value):	14.
Freezing Point (°C):	-55°C-100°C.
Boiling point/boiling range (°C):	38°C-20°C.
Flash point (°C):	None found.
Evaporation rate:	Not available.

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Flammability (Solid, gas):	Flammable.
Flammable Limits (v/v):	16% - 25%
Vapour Pressure (Pascal):	48700 – 10000 @ 20°C.
Vapour Density (Air=1):	Not available.
Density (g/ml):	0.904 – 0.89 @ at 20°C.
Bulk Density (g/ml):	Not applicable.
Solubility (Water):	Miscible.
Solubility (Other):	Not available.
Partition Coefficient (n-Octanol/water):	Log Pow – 1.14.
Auto Ignition Temperature (°C):	651°C (Vapour.)
Decomposition Temperature (°C):	Not available.
Viscosity (mPa.s):	1.1 @27°C.
Explosive properties:	Not explosive.
Oxidising properties:	Not oxidising.

Other information: No information available.

10. STABILITY AND REACTIVITY

Reactivity:	Stable under normal conditions.
Chemical stability:	Stable under recommended storage and handling conditions.
Possibility of hazardous reactions	Can react violently if in contact with acids, alkalis, halogens, reducing agents and heavy metals.
Conditions to avoid:	Keep away from incompatible materials.
Incompatible materials:	Copper, copper alloys, zinc, zinc alloy.
Hazardous decomposition products:	Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

Mixture:	
Acute Toxicity:	
Ingestion:	By analogy with similar materials: Ammonium Hydroxide: LD50 Rat: 350 mg/kg bw. Will cause corrosion of and damage to the gastrointestinal tract.
Inhalation:	Fluid build-up on the lung (pulmonary oedema) may occur up to 48 hours after exposure and could prove fatal.
Skin Contact:	Causes severe skin burns.
Eye Contact:	Severe irritant to the eye.
Skin Corrosion/Irritation:	Skin Corr. 1B; Causes severe skin burns and eye damage.
Serious eye damage/eye irritation:	Severe irritant to the eye.
Respiratory or skin sensitisation:	It is not a skin sensitizer.
Mutagenicity:	There is no evidence of mutagenic potential.
Carcinogenicity:	No evidence of carcinogenicity. NOAEL (Oral): 67 mg/kg bw/d
Reproductive toxicity:	Not classified. Effects on fertility: NOAEL: 408 mg/kg by/d Developmental toxicity: NOAEL: 100 mg/kg bw/d. NOAEC: 25 mg/m3

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STOT – Single exposure: STOT SE 3; May cause respiratory irritation.
STOT – Repeated exposure: Not classified. NOAEL (Oral): 68 mg/kg bw/d. NOAEL
Further information: Aspiration Hazard: Not classified.

12. ECOLOGICAL INFORMATION

Toxicity
Aquatic Acute 1: Very toxic to aquatic life.
By analogy with similar materials: Un-ionised ammonia.
Fish (fresh water): LC50 0.80 mg/l
Fish (fresh water): NOEC: 1.2 mg/l
Aquatic invertebrates: LC50 (Daphnia magna): 101 mg/l
Aquatic invertebrates: NOEC (Daphnia magna): 0.79 mg/l
Algae (fresh water): 2700 mg/l

Persistence and degradability: The product is biodegradable. Unlikely to persist.

Bio accumulative potential: The product has no potential for bioaccumulation.

Mobility in soil: The product is soluble in water.

Results of PBT and vPvB assessment: Not classified as PBT or vPvB.

Other adverse effects: None anticipated.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods: Re-use/recycling of waste highly recommended. Dispose of contents/container to: Licensed recycler, reclaimer or incinerator. Disposal should be in accordance with local, state or national regulations.

Additional information: WGK class 2 (official).

14. TRANSPORT INFORMATION

UN Number: UN2672
Proper Shipping Name: AMMONIA SOLUTION
Transport hazard class: 8
Packing group: III
Environmental: Yes. Environmentally Hazardous (Aquatic Environment)
Special precautions for users: No data available
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: No information available

Additional Information: Emergency Action Code: 2R
ADR Hazard Identification Number: 80
Limited Quantity: LQ7
Special Provisions: 543
Tunnel Code: (E)

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15. REGULATORY INFORMATION

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

Control of Explosive Precursors and Poisons Regulations 2023: This product is classified as a reportable poison.

Chemical safety assessment: Not available.

Note: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Legend:

- LTEL – Long term exposure limit
- STEL – Short Term Exposure Limit
- STOT – Specific Target Organ Toxicity
- DNEL – Derived No Effect Level
- PNEL – Predicted NO Effect Concentration
- PBT – PBT: Persistent, Bioaccumulative and Toxic
- CSR – Chemical Safety Report
- NOAEL – No Observable Adverse Effect Level
- NOEC – No Observable Effect Concentration
- Skin Corr. 1B – Skin corrosion/irritation Category 1B
- STOT SE 3 – Specific target organ toxicity – Single exposure Category 3
- Aquatic Acute 1 – Hazardous to the aquatic environment. Acute Category 1

Hazard Statement(s) and Precautionary statement(s):

H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.
H400 Very toxic to aquatic life.
P260 Do not breathe gas.
P264 Wash hands thoroughly after handling.
P271 Use only outdoors in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective clothing/eye protection/face protection.
P312 Call a POISON CENTRE or doctor if you feel unwell.
P321 Specific treatment (see on the label).
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.
P304 + P340 If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for Breathing.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P301 + P330 + P331 If SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

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P305 + P351 + P338 IF IN EYES: Rinse cautiously for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P405 Store locked up.

P501 Dispose of contents/containers to: Send to a licensed recycler, reclaimer or incinerator.

Legal disclaimer:

The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation. This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.