

This safety data sheet was created pursuant to the requirements of:
UK REACH Regulations (SI 2019/758 as amended)

Supersedes date 11-May-2015

Revision date 01-Nov-2023

Revision Number 1

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

1.1. Product identifier

Product Code(s) 66224

Safety data sheet number 66224

Product Name AMMONIA 5% SOLUTION

EC No (EU Index No) 215-647-6 (007-001-01-2)

CAS No 1336-21-6

Synonyms AMMONIA 5% SOL

Pure substance/mixture Substance

Contains Ammonia %

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

Recommended use Industrial application

1.3. Details of the supplier of the safety data sheet

Supplier

Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
GBR

For further information, please contact

E-mail address SDS.EMEA@univarsolutions.com

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

1.4. Emergency telephone number

Emergency Telephone SGS - +32 (0)3 575 55 55 (24h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Skin corrosion/irritation	Category 1 Sub-category B - (H314)
Serious eye damage/eye irritation	Category 1 - (H318)
Specific target organ toxicity — single exposure	Category 3 - (H335)
Chronic aquatic toxicity	Category 3 - (H412)

2.2. Label elements

Contains Ammonia %

**Signal word**

Danger

Hazard statements

H314 - Causes severe skin burns and eye damage

H412 - Harmful to aquatic life with long lasting effects

Precautionary statements

P260 - Do not breathe dust/fume/gas/mist/vapours/spray

P280 - Wear protective gloves/protective clothing and eye/face protection

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]

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

P310 - Immediately call a POISON CENTER or doctor

P405 - Store locked up

Unknown aquatic toxicity

Contains 0 % of components with unknown hazards to the aquatic environment.

Additional information

This product requires child resistant fastenings if supplied to the general public. This product requires tactile warnings if supplied to the general public.

2.3. Other hazards

The product does not contain any substance(s) classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients**3.1 Substances**

Not applicable

3.2 Mixtures

Chemical name	Weight-%	EC No (EU Index No)	UK REACH registration number	Classification according to GB CLP (SI 2020/1567 as amended)	Specific concentration limit (SCL)	M-Factor	M-Factor (long-term)
AMMONIA, ANHYDROUS 7664-41-7	5 - < 10%	231-635-3	-	Flam. Gas 2 (H221) Press. Gas () Acute Tox. 3 (H331) Skin Corr. 1B (H314) Aquatic Acute 1 (H400)	STOT SE 3 (H335) :: C>=5%	-	-

Full text of H- and EUH-phrases: see section 16

This product does not contain candidate substances of very high concern at a concentration $\geq 0.1\%$ (UK REACH Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical attention.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical attention.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical attention.
Ingestion	Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Get immediate medical attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Wear personal protective clothing (see section 8).

4.2. Most important symptoms and effects, both acute and delayed

Symptoms	Burning sensation.
Inhalation	In high concentrations, vapours may irritate throat and respiratory system and cause coughing.
Eyes	Corrosive to the eyes and may cause severe damage including blindness.
Dermal	Causes severe burns. blistering.
Ingestion	Can burn mouth, throat, and stomach

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors	Product is a corrosive material. Use of gastric lavage or emesis is contra-indicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.
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SECTION 5: Firefighting measures**5.1. Extinguishing media**

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	Harmful to aquatic life with long lasting effects. Do not flush into surface water or sanitary sewer system. Closed containers can burst violently when heated, due to excess pressure build-up.
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Hazardous combustion products Nitrogen oxides (NOx).

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation. Use personal protection recommended in Section 8. In case of insufficient ventilation, wear suitable respiratory equipment. No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering.

Other information Refer to protective measures listed in Sections 7 and 8.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions Avoid release to the environment. Do not allow runoff to sewer, waterway or ground. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Use personal protection recommended in Section 8. Avoid contact with eyes, skin and clothing. Avoid breathing vapours or mists. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid release to the environment. Empty containers retain product residue and can be hazardous.

General hygiene considerations Ensure that eyewash stations and safety showers are close to the workstation location. Do not eat, drink or smoke when using the product. Remove contaminated clothing and protective equipment before entering eating areas. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing and gloves, including the inside, before re-use.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from direct sunlight. Keep away from food, drink and animal feedingstuffs. Use appropriate containment to avoid environmental contamination. Avoid contact with: Acids. Metals.

7.3. Specific end use(s)**Specific use(s)**

See section 1 for more information.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Exposure Limits**

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Chemical name	United Kingdom
AMMONIA, ANHYDROUS 7664-41-7	TWA: 25 ppm TWA: 18 mg/m ³ STEL: 35 ppm STEL: 25 mg/m ³

Biological occupational exposure limits

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Derived No Effect Level (DNEL) - Workers

Chemical name	Oral	Dermal	Inhalation
AMMONIA, ANHYDROUS 7664-41-7		6.8 mg/kg/day [4] [7]	36 mg/m ³ [5] [7]

[4] Systemic health effects.
[7] Short term.

Derived No Effect Level (DNEL) - General Public

Chemical name	Oral	Dermal	Inhalation
AMMONIA, ANHYDROUS 7664-41-7	6.8 mg/kg/day [4] [7]	68 mg/kg/day [4] [7]	7.2 mg/m ³ [5] [7]

[4] Systemic health effects.
[5] Local health effects.
[7] Short term.

Predicted No Effect Concentration (PNEC)

Chemical name	Freshwater	Freshwater (intermittent release)	Marine water	Marine water (intermittent release)	Air
AMMONIA, ANHYDROUS 7664-41-7	0.0011 mg/l	0.0068 mg/L	0.0011 mg/l		

8.2. Exposure controls**Engineering controls**

Local and General Ventilation. Use engineering controls to keep exposures below the OEL or DNEL. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment**Eye/face protection**

Tight sealing safety goggles. Face protection shield. Tight sealing safety goggles. Face protection shield. Use eye protection according to EN 166.

Hand protection Wear suitable gloves. Impervious gloves. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves. Gloves must conform to standard EN 374.

Gloves			
Duration of contact	PPE - Glove material	Glove thickness	Break through time
Long term (repeated)	Wear protective Viton™ gloves Butyl rubber	> 0.3 mm	> 8 hours

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron. Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. In case of inadequate ventilation wear respiratory protection. Use respiratory equipment with gas filter, type K.

General hygiene considerations Ensure that eyewash stations and safety showers are close to the workstation location. Do not eat, drink or smoke when using the product. Remove contaminated clothing and protective equipment before entering eating areas. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing and gloves, including the inside, before re-use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Liquid
Colour	Colourless
Odour	Pungent. Ammonia.
Odour threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Melting point / freezing point		No information available
Initial boiling point and boiling range		No information available
Flammability		No information available
Flammability Limit in Air		No information available
Upper flammability or explosive limits		
Lower flammability or explosive limits		
Flash point		No information available
Autoignition temperature	> 651 °C	No information available
Decomposition temperature		No information available
pH	13	No information available
pH (as aqueous solution)		No information available
Kinematic viscosity		No information available
Dynamic viscosity		No information available
Water solubility	Miscible in water	No information available
Solubility(ies)		No information available
Partition coefficient		No information available
Vapour pressure		No information available
Relative density	~ 0.96	No information available
Bulk density		
Liquid Density		
Relative vapour density		No information available
Particle characteristics		No information available
Particle Size		
Particle Size Distribution		

Explosive properties	Not considered to be explosive
Oxidising properties	Does not meet the criteria for classification as oxidising

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	The following materials may react with the product:. Acids.
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10.2. Chemical stability

Stability	Stable under normal conditions.
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Explosion data

Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	None under normal processing.
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10.4. Conditions to avoid

Conditions to avoid	Protect from direct sunlight.
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10.5. Incompatible materials

Incompatible materials	Acids. Metals.
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10.6. Hazardous decomposition products

Hazardous decomposition products	None known based on information supplied.
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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information

Inhalation	Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. May cause irritation of respiratory tract.
Eye contact	Specific test data for the substance or mixture is not available. Causes serious eye damage. (based on components). Corrosive to the eyes and may cause severe damage including blindness. May cause irreversible damage to eyes.
Skin contact	Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns.
Ingestion	Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. Can burn mouth, throat, and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms

Redness. Burning. May cause blindness. Coughing and/ or wheezing. Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

Acute toxicity**Numerical measures of toxicity**

The following values are calculated based on chapter 3.1 of the GHS document

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
AMMONIA, ANHYDROUS	-	-	= 9850 mg/m ³ (Rat) 1 h = 13770 mg/m ³ (Rat) 1 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure**Skin corrosion/irritation**

Classification based on data available for ingredients. Causes severe skin burns and eye damage.

Serious eye damage/eye irritation

Classification based on data available for ingredients. Causes serious eye damage. Causes burns.

Respiratory or skin sensitisation

Based on available data the classification criteria are not met.

Germ cell mutagenicity

Based on available data the classification criteria are not met.

Carcinogenicity

Based on available data the classification criteria are not met.

Reproductive toxicity

Based on available data the classification criteria are not met.

STOT - single exposure

May cause respiratory irritation.

STOT - repeated exposure

No information available.

Aspiration hazard

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

Other adverse effects

No information available.

SECTION 12: Ecological information**12.1. Toxicity****Ecotoxicity**

Toxic to aquatic life. Harmful to aquatic life with long lasting effects. Harmful to aquatic life with long lasting effects.

Unknown aquatic toxicity

Contains 0 % of components with unknown hazards to the aquatic environment.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
AMMONIA, ANHYDROUS	-	LC50: =0.44mg/L (96h, Cyprinus carpio) LC50: 0.26 - 4.6mg/L	-	LC50: =25.4mg/L (48h, Daphnia magna)

		(96h, <i>Lepomis macrochirus</i>) LC50: =1.17mg/L (96h, <i>Lepomis macrochirus</i>) LC50: 0.73 - 2.35mg/L (96h, <i>Pimephales promelas</i>) LC50: =5.9mg/L (96h, <i>Pimephales promelas</i>) LC50: >1.5mg/L (96h, <i>Poecilia reticulata</i>) LC50: =1.19mg/L (96h, <i>Poecilia reticulata</i>)		
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12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation There is no data for this product.

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product does not contain any substance(s) classified as PBT or vPvB.

Chemical name	PBT and vPvB assessment
AMMONIA, ANHYDROUS	The substance is not PBT / vPvB PBT assessment does not apply

12.6. Other adverse effects

No information available.

SECTION 13: Disposal considerations**13.1. Waste treatment methods**

Waste from residues/unused products Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority. Empty containers retain product residue and can be hazardous. Avoid release to the environment.

Contaminated packaging Do not reuse empty containers.

SECTION 14: Transport information**IATA**

14.1 UN number or ID number Not regulated

14.2

14.3 Transport hazard class(es) Not regulated

14.4 Packing group Not regulated

14.5 Environmental hazards No

14.6 Special precautions for user
Special Provisions None

IMDG

14.1 UN number or ID number Not regulated

14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None
14.7 Maritime transport in bulk according to IMO instruments	No information available

RID

14.1 UN number or ID number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None

ADR

14.1 UN number or ID number	Not regulated
14.2 UN proper shipping name	Not regulated
14.3 Transport hazard class(es)	Not regulated
14.4 Packing group	Not regulated
14.5 Environmental hazards	No
14.6 Special precautions for user	
Special Provisions	None

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****National regulations****Authorisations and/or restrictions on use:**

This product contains one or more substances subject to restriction (UK REACH - Annex XVII).

This product does not contain substances subject to authorisation (UK REACH - Annex XIV).

Product restricted per REACH Annex XVII: 3

Persistent Organic Pollutants

Not applicable

Export Notification requirements

Not applicable

Named dangerous substances per COMAH Regulations 2015 (as amended)

Not applicable

Chemical name	Lower-tier requirements (tons)	Upper-tier requirements (tons)
AMMONIA, ANHYDROUS - 7664-41-7	50	200

The Ozone-Depleting Substances Regulations 2015

Not applicable

The Biocidal Products Regulations 2001 (as amended)

Not applicable

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended)

Not applicable

Poisons Act 1972 (Explosive Precursors) Regulations (as Amended)

Chemical name	Poisons and Explosive Precursors
AMMONIA, ANHYDROUS	Poison, Reportable 10 % w/w

International Inventories

TSCA	Contact supplier for inventory compliance status
DSL/NDL	Contact supplier for inventory compliance status
EINECS/ELINCS	Contact supplier for inventory compliance status
ENCS	Contact supplier for inventory compliance status
IECSC	Contact supplier for inventory compliance status
KECL	Contact supplier for inventory compliance status
PICCS	Contact supplier for inventory compliance status
AIIC	Contact supplier for inventory compliance status
NZIoC	Contact supplier for inventory compliance status

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals

15.2. Chemical safety assessment

Chemical Safety Report No information available

SECTION 16: Other information**Key or legend to abbreviations and acronyms used in the safety data sheet****Full text of H-Statements referred to under section 3**

H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life
H411 - Toxic to aquatic life with long lasting effects
H221 - Flammable gas
H331 - Toxic if inhaled

Legend

SVHC: Substances of Very High Concern for Authorisation:

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation
+	Sensitisers		

Revision Note ***Indicates updated data since last publication

Classification procedure

Classification according to Regulation (EC) No. 1272/2008 [CLP]	Method Used
Acute oral toxicity	Calculation method
Acute dermal toxicity	Calculation method
Acute inhalation toxicity - gas	Calculation method
Acute inhalation toxicity - vapour	Calculation method
Acute inhalation toxicity - dust/mist	Calculation method
Skin corrosion/irritation	Calculation method
Serious eye damage/eye irritation	Calculation method
Respiratory sensitisation	Calculation method
Skin sensitisation	Calculation method
Mutagenicity	Calculation method
Carcinogenicity	Calculation method
Reproductive toxicity	Calculation method

STOT - single exposure	Calculation method
STOT - repeated exposure	Calculation method
Acute aquatic toxicity	Calculation method
Chronic aquatic toxicity	Calculation method
Aspiration hazard	Calculation method
Ozone	Calculation method

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
European Chemicals Agency (ECHA) Committee for Risk Assessment (ECHA_RAC)
European Chemicals Agency (ECHA) (ECHA_API)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGl(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
National Institute of Technology and Evaluation (NITE)
Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organisation for Economic Co-operation and Development Environment, Health, and Safety Publications
Organisation for Economic Co-operation and Development High Production Volume Chemicals Programme
Organisation for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Supersedes date 11-May-2015

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**This material safety data sheet complies with the requirements of UK REACH Regulations (SI 2019/758 as amended)
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work**

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name Ammonia
REACH registration number 01-2119488876-14
CAS No 1336-21-6
EC No (EU Index No) 215-647-6
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Formulation and Distribution of substance
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC2 - Formulation of preparations (mixtures)
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)
 PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
Product category(ies) PC1 - Adhesives, sealants PC9a - Coatings and paints, thinners, paint removers PC12 - Fertilisers PC16 - Heat transfer fluids PC18 - Ink and toners PC19 - Intermediate PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents PC21 - Laboratory chemicals PC26 - Paper and board dye, finishing and impregnation products; including bleaches and other processing aids PC29 - Pharmaceuticals PC30 - Photo-chemicals PC34 - Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals PC39 - Cosmetics, personal care products PC40 - Extraction agents

Product Name Ammonia
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
 SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Covers concentrations up to 100%
Amounts used

Type	Annual amount per site
Value	1000000
Units	t(ons)/year

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Remarks	Readily biodegradable

Other operational conditions of use affecting environmental exposure

Emission days	330
Release fraction to air from process (initial release prior to RMM)	2.5%
Release fraction to wastewater from process (initial release prior to RMM)	2%

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Removal efficiency (total)	99.9%
Remarks	Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Prevent environmental discharge consistent with regulatory requirements Prevent leaks and prevent soil/water pollution caused by leaks Bund storage facilities to prevent soil and water pollution in the event of spillage
Additional good practice advice beyond the REACH Chemical Safety Report	A leak prevention plan is needed to prevent low level continual releases

Control measures to prevent releases

Air	Exhaust air scrubber.
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Waste treatment methods	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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Section 2.2: Control of worker exposure.**Control of worker exposure**

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coveralls and eye protection Efficiency of at least 90% In case of inadequate ventilation wear respiratory protection
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a predominantly closed system provided with extract ventilation Ensure operatives are trained to minimise exposures Ensure control measures are regularly inspected and maintained Only allow access to authorised persons Permit to work for maintenance work
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%

Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a predominantly closed system provided with extract ventilation Ensure operatives are trained to minimise exposures Ensure control measures are regularly inspected and maintained Only allow access to authorised persons Permit to work for maintenance work
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substance within a predominantly closed system provided with extract ventilation Ensure operatives are trained to minimise exposures Ensure control measures are regularly inspected and maintained Only allow access to authorised persons Permit to work for maintenance work
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC2 - Formulation of preparations (mixtures)

Predicted No Effect Concentration (PNEC)

Freshwater	0.0011 mg/kg
Marine water	0.00011 mg/kg

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.0000497 mg/kg	0.045
Marine water	0.000012 mg/kg	0.011

Derived No Effect Level (DNEL):

Worker - dermal, long-term - local	14 mg/m ³
Worker - dermal, long-term - systemic	6.8 mg/kg/day
Worker - inhalative, short-term - local	36 mg/m ³
Worker - inhalative, short-term - systemic	47.6 mg/m ³

Calculation method

Used ECETOC TRA model

Remarks

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	Ammonia
REACH registration number	01-2119488876-14
CAS No	1336-21-6
EC No (EU Index No)	215-647-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Industrial use
Type	Worker
Main user group	Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies)	ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC5 - Industrial use resulting in inclusion into or onto a matrix ERC6b - Industrial use of reactive processing aids ERC7 - Industrial use of substances in closed systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC7 - Industrial spraying PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring PROC19 - Hand-mixing with intimate contact and only PPE available
Product category(ies)	PC1 - Adhesives, sealants PC9a - Coatings and paints, thinners, paint removers PC14 - Metal surface treatment products, including galvanic and electroplating products PC15 - Non-metal-surface treatment products PC16 - Heat transfer fluids PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents PC26 - Paper and board dye, finishing and impregnation products; including bleaches and other processing aids PC29 - Pharmaceuticals PC30 - Photo-chemicals PC34 - Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals PC39 - Cosmetics, personal care products PC40 - Extraction agents
Product Name	Ammonia
Sector(s) of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU4 - Manufacture of food products SU5 - Manufacture of textiles, leather, fur SU6a - Manufacture of wood and wood products SU6b - Manufacture of pulp, paper and paper products SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU11 - Manufacture of rubber products SU12 - Manufacture of plastics products, including compounding and conversion SU13 - Manufacture of other non-metallic mineral products SU15 - Manufacture of fabricated metal products, except machinery and equipment SU16 - Manufacture of computer, electronic and optical products, electrical equipment SU23 - Recycling

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

- ERC5 - Industrial use resulting in inclusion into or onto a matrix
- ERC6b - Industrial use of reactive processing aids
- ERC7 - Industrial use of substances in closed systems

Covers concentrations up to 100%
Amounts used

Type	Annual amount per site
Value	25000
Units	t(ons)/year

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Remarks	Readily biodegradable

Other operational conditions of use affecting environmental exposure

Environmental release categories [ERC] ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

Emission days	330
Release fraction to air from process (initial release prior to RMM)	95%
Release fraction to wastewater from process (initial release prior to RMM)	100%

Environmental release categories [ERC] ERC5 - Industrial use resulting in inclusion into or onto a matrix

Release fraction to air from process (initial release prior to RMM)	50%
Release fraction to wastewater from process (initial release prior to RMM)	50%

Environmental release categories [ERC] ERC6b - Industrial use of reactive processing aids

Release fraction to air from process (initial release prior to RMM)	0.1%
Release fraction to wastewater from process (initial release prior to RMM)	5%

Environmental release categories [ERC] ERC7 - Industrial use of substances in closed systems

Release fraction to air from process (initial release prior to RMM)	5%
Release fraction to wastewater from process (initial release prior to RMM)	5%

Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Removal efficiency (total)	99.9%
Remarks	Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Prevent environmental discharge consistent with regulatory requirements Prevent leaks and prevent soil/water pollution caused by leaks Bund storage facilities to prevent soil and water pollution in the event of spillage
Additional good practice advice beyond the REACH Chemical Safety Report	A leak prevention plan is needed to prevent low level continual releases

Control measures to prevent releases

Air	Exhaust air scrubber.
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Waste treatment methods	All contaminated waste water must be processed in an industrial or municipal
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	wastewatertreatment plant that incorporates both primary and secondary treatments.
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Section 2.2: Control of worker exposure.

Control of worker exposure	
Process category(ies)	PROC7 - Industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% In case of inadequate ventilation wear respiratory protection
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles

	(multi-stage and/or significant contact) PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% In case of inadequate ventilation wear respiratory protection
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles

- ERC5 - Industrial use resulting in inclusion into or onto a matrix

- ERC6b - Industrial use of reactive processing aids

- ERC7 - Industrial use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.0011 mg/kg
Marine water	0.00011 mg/kg

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.0000497 mg/kg	0.045
Marine water	0.000012 mg/kg	0.011

Derived No Effect Level (DNEL):

Worker - dermal, long-term - local	14 mg/m ³
Worker - dermal, long-term - systemic	6.8 mg/kg/day
Worker - inhalative, short-term - local	36 mg/m ³

Worker - inhalative, short-term - systemic47.6 mg/m³**Calculation method**

Used ECETOC TRA model

Remarks

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name Ammonia
REACH registration number 01-2119488876-14
CAS No 1336-21-6
EC No (EU Index No) 215-647-6
Supplier Univar Solutions UK Ltd
 Aquarius House
 6 Mid Point Business Park
 Bradford
 GBR

Non-Emergency Telephone Number +44 1274 267300 / +44 1274 267306

E-mail address SDS.EMEA@univarsolutions.com

Section 1 - Title

Title Use as an intermediate
Type Worker
Main user group Industrial uses: Uses of substances as such or in preparations at industrial sites
Environmental release category(ies) ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Process category(ies) PROC1 - Use in closed process, no likelihood of exposure
 PROC2 - Use in closed, continuous process with occasional controlled exposure
 PROC3 - Use in closed batch process (synthesis or formulation)
 PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
 PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
 PROC15 - Use as laboratory reagent
 PC19 - Intermediate
Product category(ies) Ammonia
Product Name
Sector(s) of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites SU1 - Agriculture, forestry, fishery SU5 - Manufacture of textiles, leather, fur SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU12 - Manufacture of plastics products, including compounding and conversion SU24 - Scientific research and development

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Covers concentrations up to 100%
Amounts used

Type	Annual amount per site
Value	800000
Units	t(ons)/year

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Remarks	Readily biodegradable

Other operational conditions of use affecting environmental exposure

Emission days	330
Release fraction to air from process (initial release prior to RMM)	5%
Release fraction to wastewater from	2%

process (initial release prior to RMM)	
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Conditions and measures related to municipal sewage treatment plant

Type	Municipal STP
Removal efficiency (total)	90%
Remarks	Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination

Risk management measures

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Prevent environmental discharge consistent with regulatory requirements Prevent leaks and prevent soil/water pollution caused by leaks Bund storage facilities to prevent soil and water pollution in the event of spillage
Additional good practice advice beyond the REACH Chemical Safety Report	A leak prevention plan is needed to prevent low level continual releases

Control measures to prevent releases

Air	Exhaust air scrubber.
Soil	not applicable - no direct release to soil

Conditions and measures related to external treatment of waste for disposal

Waste treatment methods	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
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Section 2.2: Control of worker exposure.**Control of worker exposure**

Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15 - Use as laboratory reagent
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% In case of inadequate ventilation wear respiratory protection
Organisational measures to prevent	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear

/limit releases, dispersion and exposure	gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Predicted No Effect Concentration (PNEC)

Freshwater	0.0011 mg/kg
Marine water	0.00011 mg/kg

Calculation method Used EUSES model

Environment	predicted exposure level	Risk characterisation ratio (RCR)
Freshwater	0.0000837 mg/kg	0.076
Marine water	0.0000205 mg/kg	0.0186

Derived No Effect Level (DNEL):

Worker - dermal, long-term - local	14 mg/m ³
Worker - dermal, long-term - systemic	6.8 mg/kg/day
Worker - inhalative, short-term - local	36 mg/m ³
Worker - inhalative, short-term - systemic	47.6 mg/m ³

Calculation method

Used ECETOC TRA model

Remarks

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	Ammonia
REACH registration number	01-2119488876-14
CAS No	1336-21-6
EC No (EU Index No)	215-647-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Professional use
Type	Worker
Main user group	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Environmental release category(ies)	ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8e - Wide dispersive outdoor use of reactive substances in open systems ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems
Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC11 - Non industrial spraying PROC13 - Treatment of articles by dipping and pouring PROC15 - Use as laboratory reagent PROC19 - Hand-mixing with intimate contact and only PPE available PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Product category(ies)	PC9a - Coatings and paints, thinners, paint removers PC12 - Fertilisers PC14 - Metal surface treatment products, including galvanic and electroplating products PC15 - Non-metal-surface treatment products PC16 - Heat transfer fluids PC19 - Intermediate PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents PC21 - Laboratory chemicals PC29 - Pharmaceuticals PC30 - Photo-chemicals PC34 - Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC35 - Washing and cleaning products (including solvent based products) PC37 - Water treatment chemicals PC40 - Extraction agents
Product Name	Ammonia
Sector(s) of use	SU22 - Professional uses SU1 - Agriculture, forestry, fishery SU4 - Manufacture of food products SU5 - Manufacture of textiles, leather, fur SU6a - Manufacture of wood and wood products SU6b - Manufacture of pulp, paper and paper products SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys) SU11 - Manufacture of rubber products SU12 - Manufacture of plastics products, including compounding and conversion SU15 - Manufacture of fabricated metal products, except machinery and equipment SU16 - Manufacture of computer, electronic and optical products,

electrical equipment SU17 - General manufacturing SU24 - Scientific research and development

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems

- ERC8e - Wide dispersive outdoor use of reactive substances in open systems

- ERC9a - Wide dispersive indoor use of substances in closed systems

- ERC9b - Wide dispersive outdoor use of substances in closed systems

Remarks No exposure assessment presented for the environment. Not applicable for wide dispersive uses.

Section 2.2: Control of worker exposure.

Control of worker exposure	
Process category(ies)	PROC11 - Non industrial spraying
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC19 - Hand-mixing with intimate contact and only PPE available
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% Wear a respirator providing a minimum efficiency of 95%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use
Process category(ies)	PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact) PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10 - Roller application or brushing PROC13 - Treatment of articles by dipping and pouring
Covers concentrations up to	100%

Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% In case of inadequate ventilation wear respiratory protection
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC2 - Use in closed, continuous process with occasional controlled exposure PROC3 - Use in closed batch process (synthesis or formulation) PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15 - Use as laboratory reagent PROC20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	Local exhaust ventilation - efficiency of at least 90%
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90% In case of inadequate ventilation wear respiratory protection
Organisational measures to prevent /limit releases, dispersion and exposure	Ensure operatives are trained to minimise exposures Only allow access to authorised persons
Indoor/Outdoor use	Covers indoor and outdoor use

Process category(ies)	PROC1 - Use in closed process, no likelihood of exposure
Covers concentrations up to	100%
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Use frequency	Covers use up to 480 minutes per day
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves (tested to EN 374), coverall and eye protection Efficiency of at least 90%
Organisational measures to prevent /limit releases, dispersion and exposure	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop
Indoor/Outdoor use	Covers indoor and outdoor use

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems
- ERC8e - Wide dispersive outdoor use of reactive substances in open systems
- ERC9a - Wide dispersive indoor use of substances in closed systems
- ERC9b - Wide dispersive outdoor use of substances in closed systems

Predicted No Effect Concentration (PNEC)

Freshwater	0.0011 mg/kg
Marine water	0.00011 mg/kg

Calculation method

Used EUSES model

Remarks

Qualitative approach used to conclude safe use

Derived No Effect Level (DNEL):

Worker - dermal, long-term - local	14 mg/m ³
Worker - dermal, long-term - systemic	6.8 mg/kg/day
Worker - inhalative, short-term - local	36 mg/m ³
Worker - inhalative, short-term - systemic	47.6 mg/m ³

Calculation method

Used ECETOC TRA model

Remarks

Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

Annex to the Safety Data Sheet according to Regulation (EC) No 1907/2006 [REACH]

Product Name	Ammonia
REACH registration number	01-2119488876-14
CAS No	1336-21-6
EC No (EU Index No)	215-647-6
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford GBR
Non-Emergency Telephone Number	+44 1274 267300 / +44 1274 267306
E-mail address	SDS.EMEA@univarsolutions.com

Section 1 - Title

Title	Consumer use
Type	Consumer
Main user group	Consumer uses: Private households (= general public = consumers)
Environmental release category(ies)	ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8e - Wide dispersive outdoor use of reactive substances in open systems ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b - Wide dispersive outdoor use of substances in closed systems
Product category(ies)	PC9a - Coatings and paints, thinners, paint removers PC16 - Heat transfer fluids PC35 - Washing and cleaning products (including solvent based products) PC39 - Cosmetics, personal care products
Product Name	Ammonia
Sector(s) of use	SU21 - Consumer uses

Section 2 - Operational conditions and risk management measures

Section 2.1 - Control of environmental exposure

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems
 - ERC8e - Wide dispersive outdoor use of reactive substances in open systems
 - ERC9a - Wide dispersive indoor use of substances in closed systems
 - ERC9b - Wide dispersive outdoor use of substances in closed systems

Remarks	No exposure assessment presented for the environment. Not applicable for wide dispersive uses.
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Section 2.2: Control of consumer exposure.

Control of consumer exposure

Product categories [PC]	PC9 - Coatings and paints, fillers, putties, thinners
Covers concentrations up to	0.05%
Physical form of product	Liquid
Use frequency	Covers use up to 12 days per year 1 events per day
Risk management measures	Wear suitable gloves and eye/face protection

Product categories [PC]	PC16 - Heat transfer fluids
Physical form of product	Liquid

Product categories [PC]	PC35 - Washing and cleaning products (including solvent based products)
Covers concentrations up to	0.125%
Physical form of product	Liquid
Use frequency	Covers use up to 52 days per week 1 events per day
Risk management measures	Wear suitable gloves and eye/face protection

Product categories [PC]	PC39 - Cosmetics, personal care products
Covers concentrations up to	4%
Physical form of product	Liquid
Use frequency	Covers use up to 12 days per year 1 events per day
Risk management measures	Wear suitable gloves and eye/face protection

Section 3 - Exposure estimation

Environmental release category(ies) - ERC8b - Wide dispersive indoor use of reactive substances in open systems

- ERC8e - Wide dispersive outdoor use of reactive substances in open systems

- ERC9a - Wide dispersive indoor use of substances in closed systems

- ERC9b - Wide dispersive outdoor use of substances in closed systems

**Predicted No Effect Concentration
(PNEC)**

Derived No Effect Level (DNEL):

Section 4 - Guidance to check compliance with the exposure scenario

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.