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

1.1 Product identifier

Product name: Ammonia, anhydrous

Trade name: Ammonia Heat Treatment Grade N3.8, Ammonia Micrographic Grade N3.8, Ammonia Premium Grade N3.8, Ammonia Refrigerant Grade N3.8

Additional identification

Chemical name: ammonia, anhydrous

Chemical formula: NH3
INDEX No. 007-001-00-5
CAS-No. 7664-41-7
EC No. 231-635-3
REACH Registration No. 01-2119488876-14

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

Identified uses: Industrial and professional. Perform risk assessment prior to use. Casting operations. Explosives manufacture & use. Freezing, chilling, and packaging of foodstuffs. Manufacturing of fertilisers and nitric acid. Production of plastics. Refrigerant. Use for electronic component manufacture. Use of gas to manufacture pharmaceutical products. Using gas alone or in mixtures for the calibration of analysis equipment. Using gas as feedstock in chemical processes. Using gas for metal treatment. Washing of textiles or metal parts. Water treatment. Use in laboratories

Uses advised against Consumer use.

1.3 Details of the supplier of the safety data sheet

Supplier

BOC
Priestley Road, Worsley
M28 2UT Manchester

Telephone: 0800 111 333

E-mail: ReachSDS@boc.com

1.4 Emergency telephone number: 0800 111 333

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Directive 67 / 548 / EEC or 1999 / 45 / EC as amended.

R10 T; R23 C; R34 N; R50

The full text for all R-phrases is displayed in section 16.

Classification according to Regulation (EC) No 1272 / 2008 as amended.

Physical Hazards

Flammable gas	Category 2	H221: Flammable gas.
Gases under pressure	Liquefied gas	H280: Contains gas under pressure; may explode if heated.

Health Hazards

Acute toxicity (Inhalation - gas)	Category 3	H331: Toxic if inhaled.
Skin corrosion	Category 1B	H314: Causes severe skin burns and eye damage.
Serious eye damage	Category 1	H318: Causes serious eye damage.

Environmental Hazards

Acute hazards to the aquatic environment	Category 1	H400: Very toxic to aquatic life.
Chronic hazards to the aquatic environment	Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label Elements

Contains: ammonia, anhydrous

Signal Words: Danger

Hazard Statement(s):
H221: Flammable gas.
H280: Contains gas under pressure; may explode if heated.
H314: Causes severe skin burns and eye damage.
H331: Toxic if inhaled.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statement

Prevention:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: Do not breathe gas / vapours.
P273: Avoid release to the environment.
P280: Wear protective gloves / protective clothing / eye protection / face protection.

Response:

P303+P361+P353+P315: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water / shower. Get immediate medical advice / attention.
P304+P340+P315: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice / attention.
P305+P351+P338+P315: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice / attention.
P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381: Eliminate all ignition sources if safe to do so.

Storage:

P403: Store in a well-ventilated place.
P405: Store locked up.

Disposal:

None.

Supplemental label information

EUH071: Corrosive to the respiratory tract.

2.3 Other hazards:

Contact with evaporating liquid may cause frostbite or freezing of skin.

SECTION 3: Composition / information on ingredients

3.1 Substances

Chemical name	ammonia, anhydrous
INDEX No.:	007-001-00-5
CAS-No.:	7664-41-7
EC No.:	231-635-3
REACH Registration No.:	01-2119488876-14
Purity:	100% The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.
Trade name:	Ammonia Heat Treatment Grade N3.8, Ammonia Micrographic Grade N3.8, Ammonia Premium Grade N3.8, Ammonia Refrigerant Grade N3.8

SECTION 4: First Aid Measures

General: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

4.1 Description of first aid measures

Inhalation: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Eye contact: Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Contact with evaporating liquid may cause frostbite or freezing of skin.

Ingestion: Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed: Causes severe skin burns and eye damage. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. May be fatal if inhaled.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards: Causes severe skin burns and eye damage. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. May be fatal if inhaled.

Treatment: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice / attention. Treat with a corticosteroid spray as soon as possible after inhalation.

SECTION 5: Firefighting Measures

General Fire Hazards: Heat may cause the containers to explode.

5.1 Extinguishing media

Suitable extinguishing media: Use water spray to reduce vapours or divert vapour cloud drift. Water Spray or Fog. Dry powder. Foam.

Unsuitable extinguishing media: Carbon dioxide. Do not use water jet, as this may cause corrosive liquid to splash.

5.2 Special hazards arising from the substance or mixture: Fire or excessive heat may produce hazardous decomposition products. Fire or excessive heat may produce hazardous decomposition products.

Hazardous Combustion Products: If involved in a fire the following toxic and / or corrosive fumes may be produced by thermal decomposition: Nitrogen monoxide
; nitrogen dioxide

5.3 Advice for firefighters

Special fire fighting procedures: In case of fire: Stop leak if safe to do so. Use of water may result in the formation of very toxic aqueous solutions. Keep run-off water out of sewers and water sources. Dyke for water control. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.

Special protective equipment for firefighters: Gas tight chemically protective clothing (Type 1) in combination with self contained breathing apparatus.
Guideline: EN 943-2 Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams (ET)

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures: Evacuate area. Provide adequate ventilation. Consider the risk of potentially explosive atmospheres . Eliminate all ignition sources if safe to do so. Monitor the concentration of the released product. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

6.2 Environmental Precautions: Prevent further leakage or spillage if safe to do so. Reduce vapour with fog or fine water spray. Keep run-off water out of sewers and water sources. Dyke for water control.

6.3 Methods and material for containment and cleaning up: Provide adequate ventilation. Eliminate sources of ignition. Wash contaminated equipment or sites of leaks with copious quantities of water.

6.4 Reference to other sections: Refer to sections 8 and 13.

SECTION 7: Handling and Storage:

7.1 Precautions for safe handling:

Only experienced and properly instructed persons should handle gases under pressure. Avoid exposure - obtain special instructions before use. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Purge air from system before introducing gas. Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Assess the risk of a potentially explosive atmosphere and the need for suitable equipment i.e. explosion-proof. Take precautionary measures against static discharges. Keep away from ignition sources (including static discharges). Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Use only non-sparking tools. Installation of a cross purge assembly between the container and the regulator is recommended. Excess pressure must be vented through an appropriate scrubber system. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Ensure the complete system has been (or is regularly) checked for leaks before use. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local / regional / national / international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the supplier Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place.

7.2 Conditions for safe storage, including any incompatibilities:

All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Segregate from oxidant gases and other oxidants being stored. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Keep away from food, drink and animal feeding stuffs. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

7.3 Specific end use(s):

None.

SECTION 8: Exposure Controls / Personal Protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	type	Exposure Limit Values	Source
ammonia, anhydrous	TWA	25 ppm 18 mg / m3	UK. EH40 Workplace Exposure Limits (WELs) (12 2011)
	STEL	35 ppm 25 mg / m3	UK. EH40 Workplace Exposure Limits (WELs) (12 2011)
	TWA	20 ppm 14 mg / m3	EU. Indicative Exposure Limit Values in Directives 91 / 322 / EEC, 2000 / 39 / EC, 2006 / 15 / EC, 2009 / 161 / EU (12 2009)
	STEL	50 ppm 36 mg / m3	EU. Indicative Exposure Limit Values in Directives 91 / 322 / EEC, 2000 / 39 / EC, 2006 / 15 / EC, 2009 / 161 / EU (12 2009)

DNEL-Values

Critical component	type	Value	Remarks
ammonia, anhydrous	Worker - dermal, short-term - systemic	6.8 mg / kg bw / day	-
	Worker - inhalative, short-term - local	36 mg / m3	-
	Worker - inhalative, long-term - local	14 mg / m3	-
	Worker - inhalative, long-term - systemic	47.6 mg / m3	-
	Worker - inhalative, short-term - systemic	47.6 mg / m3	-
	Worker - dermal, long-term - systemic	6.8 mg / kg bw / day	-

PNEC-Values

Critical component	type	Value	Remarks
ammonia, anhydrous	Aquatic (intermit. releases)	0.0068 mg / l	-
	Aquatic (marine water)	0.0011 mg / l	-
	Aquatic (freshwater)	0.0011 mg / l	-

8.2 Exposure controls

Appropriate engineering controls:

Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below occupational exposure limits. Gas detectors should be used when toxic quantities may be released. Gas detectors should be used when quantities of flammable gases or vapours may be released. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system and under strictly controlled conditions. Use only permanent leak tight installations (e.g. welded pipes). Take precautionary measures against static discharges. Do not eat, drink or smoke when using the product.

Individual protection measures, such as personal protective equipment

General information:

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Protect eyes, face and skin from contact with product. Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Eye / face protection:

Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Guideline: EN 166 Personal Eye Protection.

Skin protection

Hand Protection:

Wear working gloves while handling containers
Guideline: EN 388 Protective gloves against mechanical risks.
Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Material: Chloroprene rubber.
Break-through time: 30 min
Glove thickness: 0.5 mm
Guideline: EN 374-1 / 2 / 3 Protective gloves against chemicals and micro-organisms.
Chemically resistant gloves complying with EN 374 should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Material: Butyl rubber.
Break-through time: 480 min
Glove thickness: 0.7 mm
Guideline: EN 374-1 / 2 / 3 Protective gloves against chemicals and micro-organisms.

Body protection:

Wear fire / flame resistant / retardant clothing. Keep suitable chemically resistant protective clothing readily available for emergency use.
Guideline: ISO / TR 2801:2007 Clothing for protection against heat and flame -- General recommendations for selection, care and use of protective clothing.Guideline: EN 943 Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles.

Other:	Wear safety shoes while handling containers Guideline: ISO 20345 Personal protective equipment - Safety footwear.
Respiratory Protection:	Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances. The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD. Material: Filter K Guideline: EN 14387 Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements, testing, marking. Guideline: EN 136 Respiratory protective devices. Full face masks. Requirements, testing, marking.
Thermal hazards:	No precautionary measures are necessary.
Hygiene measures:	Obtain special instructions before use. Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product.
Environmental exposure controls:	For waste disposal, see section 13.

SECTION 9: Physical And Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance	
Physical state:	Gas
Form:	Liquefied gas
Colour:	Colourless
Odour:	ammoniacal
Odour Threshold:	Odour threshold is subjective and is inadequate to warn of over exposure.
pH:	If dissolved in water pH-value will be affected.
Melting Point:	-77.7 °C
Boiling Point:	-33.35 °C
Sublimation Point:	not applicable.
Critical Temp. (°C):	132.0 °C
Flash Point:	Not applicable to gases and gas mixtures.
Evaporation Rate:	Not applicable to gases and gas mixtures.
Flammability (solid, gas):	Flammable Gas
Flammability limit - upper (%):	33.6 %(V)
Flammability limit - lower(%):	15.4 %(V)
Vapour pressure:	857.1 kPa (20 °C)
Vapour density (air=1):	0.59 AIR=1
Relative density:	0.8
Solubility(ies)	

Solubility in Water:	531 g/l (20 °C)
Partition coefficient (n-octanol/water):	< 1
Autoignition Temperature:	630 °C
Decomposition Temperature:	> 450 °C
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0.255 mPa.s (-33.5 °C)
Explosive properties:	Not applicable.
Oxidising Properties:	not applicable.

9.2 Other information: None.

Molecular weight:	17.03 g/mol (NH_3)
Minimum ignition energy:	680 mJ

SECTION 10: Stability and Reactivity

10.1 Reactivity: No reactivity hazard other than the effects described in sub-section below.

10.2 Chemical Stability: Stable under normal conditions.

10.3 Possibility of Hazardous Reactions: Can form a potentially explosive atmosphere in air. May react violently with oxidants.

10.4 Conditions to Avoid: Avoid moisture in the installation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5 Incompatible Materials: Air and oxidisers. Moisture. For material compatibility see latest version of ISO-11114. Reacts with water to form corrosive alkalis. May react violently with acids.

10.6 Hazardous Decomposition Products: Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: The following decomposition products may be produced: Nitrogen monoxide
; nitrogen dioxide

SECTION 11: Toxicological Information

General information: Inhalation of large amounts leads to bronchospasm, laryngeal oedema and pseudomembrane formation.

11.1 Information on toxicological effects

Acute toxicity - Oral

Product	Based on available data, the classification criteria are not met.
ammonia, anhydrous	LD 50 (Rat): 350 mg/kg

Acute toxicity - Dermal

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

Acute toxicity - Inhalation

Product	Toxic by inhalation. Toxic if inhaled.
ammonia, anhydrous	LC 50 (Rat, 1 h): 4000 ppm

Repeated dose toxicity

ammonia, anhydrous	LOAEL (Rat, Inhalation, 35 - 75 d): 175 mg / m3

Skin Corrosion / Irritation

Product	Causes severe burns.

Serious Eye Damage / Eye Irritation

Product	Causes serious eye damage.

Respiratory or Skin Sensitisation

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

Germ Cell Mutagenicity

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

Carcinogenicity

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

Reproductive toxicity

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

Specific Target Organ Toxicity - Single Exposure

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

Specific Target Organ Toxicity - Repeated Exposure

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

Aspiration Hazard

Product	Not applicable to gases and gas mixtures..

SECTION 12: Ecological Information

General information: Avoid release to the environment. Product is not allowed to be discharged into ground water or the aquatic environment.

12.1 Toxicity

Acute toxicity
Product Very toxic to aquatic life with long lasting effects.

Acute toxicity - Fish
ammonia, anhydrous LC 50 (Fish, 96 h): 0.89 mg / l

Acute toxicity - Aquatic Invertebrates
ammonia, anhydrous LC 50 (Water flea (Daphnia), 48 h): 101 mg / l

Toxicity to microorganisms
ammonia, anhydrous Depending on local conditions and existing concentrations, disturbances in the biodegradation process of activated sludge are possible.

Toxicity to terrestrial organisms
ammonia, anhydrous Study not necessary due to exposure considerations.

Chronic toxicity - Fish
ammonia, anhydrous LOEC (Fish, 73 Days): 0.022 mg / l

Chronic toxicity - Aquatic Invertebrates
ammonia, anhydrous NOEC (Water flea, 96 hrs): 0.79 mg / l

Toxicity to aquatic plants
ammonia, anhydrous LC 50 (Algae, algal mat (Algae), 18 Days): 2,700 mg / l

12.2 Persistence and Degradability
Product Not applicable to gases and gas mixtures..

Biodegradation
Inorganic The product is not readily biodegradable.

12.3 Bioaccumulative Potential
Product The substance has no potential for bioaccumulation.

12.4 Mobility in Soil
Product The substance has low mobility in soil.

ammonia, anhydrous | Henry's Law Constant: 0.09028 MPa (25 °C)

12.5 Results of PBT and vPvB assessment

Product | Not classified as PBT or vPvB.

12.6 Other Adverse Effects:

Other Ecological Information

May cause pH changes in aqueous ecological systems. Depending on local conditions and existing concentrations, disturbances in the biodegradation process of activated sludge are possible.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

General information: Must not be discharged to atmosphere. Consult supplier for specific recommendations.

Disposal methods: Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at http: / /www.eiga.org) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Gas may be scrubbed in water. Gas may be scrubbed in sulphuric acid solution.

European Waste Codes

Container: 16 05 04*: gases in pressure containers (including halons) containing dangerous substances

SECTION 14: Transport Information

ADR

14.1 UN Number:	UN 1005
14.2 UN Proper Shipping Name:	AMMONIA, ANHYDROUS
14.3 Transport Hazard Class(es)	
Class:	2
Label(s):	2.3, 8
Hazard No. (ADR):	268
Tunnel restriction code:	(C / D)
Emergency Action Code:	2RE
14.4 Packing Group:	–
14.5 Environmental hazards:	Environmentally Hazardous
14.6 Special precautions for user:	–

RID

14.1 UN Number:	UN 1005
14.2 UN Proper Shipping Name	AMMONIA, ANHYDROUS
14.3 Transport Hazard Class(es)	
Class:	2
Label(s):	2.3, 8
14.4 Packing Group:	–
14.5 Environmental hazards:	Environmentally Hazardous
14.6 Special precautions for user:	–

IMDG

14.1 UN Number:	UN 1005
14.2 UN Proper Shipping Name:	AMMONIA, ANHYDROUS
14.3 Transport Hazard Class(es)	
Class:	2.3
Label(s):	2.3, 8
EmS No.:	F-C, S-U
14.3 Packing Group:	–
14.5 Environmental hazards:	not applicable
14.6 Special precautions for user:	–

IATA

14.1 UN Number:	UN 1005
14.2 Proper Shipping Name:	Ammonia, anhydrous
14.3 Transport Hazard Class(es):	
Class:	2.3
Label(s):	–
14.4 Packing Group:	–
14.5 Environmental hazards:	Environmentally Hazardous
14.6 Special precautions for user:	–
Other information	
Passenger and cargo aircraft:	Forbidden.
Cargo aircraft only:	Forbidden.

14.7 Transport in bulk according to Annex II of MARPOL73 / 78 and the IBC Code: not applicable

Additional identification: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Container valve guards or caps should be in place. Ensure adequate air ventilation.

SECTION 15: Regulatory information

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

EU Regulations

Directive 96 / 61 / EC: concerning integrated pollution prevention and control (IPPC): Article 15, European Pollution Emission Registry (EPER):

Chemical name	CAS-No.	Concentration
ammonia, anhydrous	7664-41-7	100%

Directive 96 / 82 / EC (Seveso II): on the control of major accident hazards involving dangerous substances:

Chemical name	CAS-No.	Concentration
ammonia, anhydrous	7664-41-7	100%

Directive 98 / 24 / EC on the protection of workers from the risks related to chemical agents at work:

Chemical name	CAS-No.	Concentration
ammonia, anhydrous	7664-41-7	100%

National Regulations

Dangerous Substances and Explosive Atmospheres Regulations (DSEAR 2002 No. 2776). Management of Health and Safety at Work Regulations (1999 No. 3242). The Regulatory Reform (Fire Safety) Order 2005 (2005 No. 1541). Control of Substances Hazardous to Health Regulations (COSHH, 2002 No. 2677). Provision and Use of Work Equipment Regulations (PUWER, 1998 No. 2306). Personal Protective Equipment Regulations (1992 No. 2966). Control of Major Accident Hazards Regulations (COMAH, 2015 No. 483). Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations (EPS, 1996 No. 192). Pressure Systems Safety Regulations (PSSR, 2000 No. 128). Only products that comply with the food regulations (EC) No. 1333 / 2008 and (EU) No. 231 / 2012 and are labelled as such may be used as food additives.
This Safety Data Sheet has been produced to comply with Regulation (EU) 453 / 2010.

15.2 Chemical safety assessment: CSA has been carried out.

SECTION 16: Other Information

Revision Information: Not relevant.

Key literature references and sources for data:

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/).
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.
European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search
European Industrial Gases Association (EIGA) Doc. 169 Classification and Labelling guide.
International Programme on Chemical Safety (http://www.inchem.org/)
ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
Matheson Gas Data Book, 7th Edition.
National Institute for Standards and Technology (NIST) Standard Reference Database Number 69.
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
The European Chemical Industry Council (CEFIC) ERICards.
United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html)
Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).
Substance specific information from suppliers.
Details given in this document are believed to be correct at the time of publication.
EH40 (as amended) Workplace exposure limits.

Wording of the R-phrases and H-statements in sections 2 and 3

H221	Flammable gas.
H280	Contains gas under pressure; may explode if heated.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
R10	Flammable.
R23	Toxic by inhalation.
R34	Causes burns.
R50	Very toxic to aquatic organisms.

Training information:

Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.

Classification according to Regulation (EC) No 1272/2008 as amended.

Flam. Gas 2, H221
Press. Gas Liq. Gas, H280
Acute Tox. 3, H331
Skin Corr. 1B, H314
Eye Dam. 1, H318
Aquatic Acute 1, H400
Aquatic Chronic 2, H411

Other information: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national / local regulations are observed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Note: When the Product Name appears in the SDS header the decimal sign and its position comply with rules for the structure and drafting of international standards, and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

Last revised date: 18.12.2015

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.