

PRODUCT DATA SHEET

(This booklet incorporates the Specification and M.S.D.S.)

PRODUCT		AMMONIA SOLUTION	
CAS NO.	1336-21-6		
TARIFF NO.	281420000		
U.N NO.	8/2672		
EINECS NO.	215-647-6		
IMCO CLASS	8-CORROSIVE		
HAZARDS	CORROSIVE / VERY TOXIC TO AQUATIC ORGANISMS		
SPECIFICATION REFERENCE	AL204/281/6	DATE AUG 94	
REFERENCE NO.	AMLI/4	DATE APR 99	
PREVIOUS EDITION.	AMLI/3	DATE JAN 98	

PRODUCT SPECIFICATION		
Product Name	Ammonia Solution A	
Alternative Name	Aqueous Ammonia, ammonia Liquor, Ammonium Hydroxide	
Product Grade		
SALES SPECIFICATION		
PROPERTIES	GUARANTEE CHARACTERISTICS	TYPICAL ANALYSIS
Ammonia Content	33.5% +0.5% -1%	33.5 % m/m
Specific Gravity.at 15.5°C	0.884 to 0.890	0.885
Chloride as Cl	< 5 ppm m/m	0.2 ppm m/m
Sulphate as SO4	< 5 ppm m/m	0.1 ppm m/m
Iron as Fe	< 1ppm m/m	0.1 ppm m/m
Sodium as Na	< 2 ppm m/m	0. ppm m/m
Copper as Cu	< 1 ppm m/m	< 0.01 ppm m/m
Lead as Pb	< 1 ppm m/m	< 0.1 ppm m/m
Mercury as Hg	< 10 ppb m/m	< 5 ppb m/m
Arsenic as As	< 1 ppm m/m	< 0.3 ppm m/m
Nitrogen	27/28%	
Colour	< 15 HU	5 HU
Turbidity	< 3 NTU	< 1 NTU
Residue on Evaporation	< 25 ppm m/m	12 ppm m/m
<u>GRADE</u>	<u>ASSAY</u>	<u>SPECIFIC GRAVITY</u>
890	32% +/- 1.5%	890 +/- 0.005
900	28.5% +/- 1.5%	900 +/- 0.005
910	25% +/- 1.5%	910 +/- 0.005
925	19% +/- 1.5%	925 +/- 0.005
938	16% +/- 1.5%	938 +/- 0.005
960	10% +/- 1.7%	960 +/- 0.005

To assess the purity of Ince Aqueous Ammonia, the following typical analysis has been carried out to measure the presence of a range of additional elements:

Calcium as Ca	< 0.5 ppm m/m
Magnesium as Mg	< 0.1 ppm m/m
Potassium as K	< 0.1 ppm m/m
Silicon as Si	< 1.0 ppm m/m

Notes. 1. Ammonia loses strength with time and the greater the temperature the greater the reduction in strength. Strength and Specific Gravity quoted will apply at the time of delivery and one month from that delivery.

2. Dilutions are carried out with distilled water hence the specification with reference to contaminants for 885 applies to all other grades.

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

Product: AMMONIA

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name:	Ammonium Hydroxide
CAS No.:	1336-21-6
EINECS No.:	215-647-6

3. HAZARDS IDENTIFICATION

Main Hazards	Corrosive - causes burns Irritant - irritating to the respiratory system
Health Effects - Eyes	Splashes in the eyes can produce severe burns, redness and pain resulting in blurred vision. In extreme cases permanent damage and even blindness may result. The full effects of ammonia in the eyes may not manifest for 8 to 10 days.
Health Effects - Skin	Ammonia Solution in contact with skin will cause redness, pain and serious burns dependent on the concentration and duration of contact
Health Effects - Ingestion	Ammonia Solution will cause mouth and throat burns, abdominal pain and nausea.
Health Effects - Inhalation	Ammonia vapour is readily vaporised from ammonia solutions, inhalation of which will result in irritation and inflammation of the mucous membranes in the respiratory system. Resulting in sore throat, coughing and impair breathing. When exposed to more concentrated vapour, oedema of the respiratory system, spasm of the glottis and asphyxia may result. In some cases the onset of oedema may be delayed for several hours, though in severe cases it will occur immediately. Swelling of the bronchi and trachea can obstruct breathing.
Environmental Hazards	Free Ammonia is very toxic to aquatic life.

4. FIRST AID MEASURES

First Aid -Skin	While removing contaminated clothing, rinse affected areas thoroughly, preferably under a water shower. Seek medical attention if redness, pain or blistering persists.
First Aid - Eyes	Flood eyes with clean tap water for 30 minutes, followed by immediate medical attention.
First Aid - Ingestion:	Rinse mouth with water and give plenty of water to drink. Do not induce vomiting, but seek medical assistance immediately.
First Aid - Inhalation	Remove patient to fresh air immediately. Remove contaminated clothing, keep patient warm and rested. Seek medical assistance immediately. Patient must be kept under observation due to possibility of delayed effects.

5. FIRE FIGHTING MEASURES

Ammonia Solutions are non-flammable. Ammonia vapour released from solution can be flammable in air. This is only likely if a significant spillage occurs in a confined space.
If exposed to fire, storage tanks must be kept cool to avoid pressure rise and possible tank rupture.

6. ACCIDENTAL RELEASE MEASURES

Spillages	In the event of product spillage, avoid contact by wearing protective clothing and breathing apparatus as appropriate.
Environmental Precautions:	Collect small spillages in suitable containers. Inform relevant authorities if contamination of water courses or drains is likely. Where not possible to collect and recover product, neutralize and wash to drains with a large excess of water.

7. HANDLING AND STORAGE

Handling

Exposure to Ammonia Solution is avoided by handling in closed tanks and pipe work systems. If part of a system must be indoors, then care should be taken to isolate from occupied work areas and provide an adequate level of ventilation.

For pipe work and general equipment the following materials are acceptable: stainless and mild steels, cast iron, polyethylene and polypropylene, epoxy and furane resins. Neoprene, nitrile and butyl rubbers are also suitable.

Copper and copper alloys (brass, bronze etc) alloys of zinc, cadmium or tin must not be used. Phenolic and polyester resins and polysulphide rubbers are not suitable.

Storage

Bulk tanks and delivery points are best located outdoors and remote from occupied buildings and work areas. Tanks should be banded to facilitate protection from accidental impact and secondary containment in the event of tank failure or spillage. Stainless or mild steels are the recommended construction materials for bulk storage vessels. Polyethylene, polypropylene and polypropylene externally reinforced with resin impregnated fibreglass may be considered for small non-pressurised storage vessels.

Tanks must be designed as closed vessels with due regard to internal pressure and vacuum rating and provision of adequate venting/breathing. Due to the very high solubility of ammonia, care must be exercised when adding water to vessels contained ammonia to avoid rapid vacuum formation.

Electrical Equipment

Ammonia/air mixtures are flammable over a limited range (16 to 27% ammonia) and may be ignited with difficulty. Consideration must therefore be given to classification of electrical equipment for ammonia installations. Appropriate classification will depend on assessment of the maximum credible spill and the degree of ventilation available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure
Standard (ref - EH 40)

Ammonia Vapour OES 25 ppm (8hr TWA)
35 ppm (10 min TWA)

Engineering Control Measures

Handle Ammonia Solution within closed systems wherever possible. Provide adequate ventilation

Where risk of exposure exists, such as tanker loading/unloading procedures, non routine operations or emergency circumstances, the following personal protection measures are recommended:

Respiratory Protection

Self contained breathing apparatus recommended where risk of exposure to vapour occurs.

Hand Protection

PVC or rubber gloves satisfactory for splashes.

Eye Protection

Chemical splash goggles (gas tight type preferred)

Skin Protection

PVC suits or rubber aprons, industrial rubber boots dependent on degree of splash risk

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Clear, colourless liquid

Odour

Strong pungent characteristic smell

pH

Moderately strong alkali

Boiling Point

+ 20°C

Freezing Point

- 95°C

Specific Gravity

0.885 @ 15.5°C

Vapour Relative Density

0.6 (Air = 1.0)

Vapour Pressure

101 kPa @ 20°C

Solubility

Miscible with water in all proportions

Flammability

Liquid not flammable. Ammonia vapour will form flammable mixtures in air at concentrations between 16% and 27% by volume

Auto flammability

+ 651°C for ammonia vapour in contact with steel surfaces

10. STABILITY AND REACTIVITY	
Stability	Ammonia Solution is chemically stable at ambient conditions; however ammonia vapour will be lost from the liquid as the temperature increases
Reactivity	Ammonia Solution will react with acids and acid gases to form ammonium salts
Hazardous Reactions	Violent reactions may occur or unstable/explosive products be formed when Ammonia Solutions comes into contact with:- Halogens and their salts Hypochlorites Oxidising agents Mineral acids Mercury Oxides of mercury, silver, lead and cadmium Boron halides Bismuth, thallium and gold Note: instruments containing mercury must not be used in ammonia service
11. TOXICOLOGICAL INFORMATION	
Toxicity Data	Rat LD50, 350 mg/kg oral; rat LC50, 1.4 mg/l inh. Listed in Part II of the Poisons List under the Poisons Act 1982
Skin and Eyes	Corrosive material will cause burns. Vapour irritating to the eyes.
Inhalation	Breathing of vapour will cause irritation of the respiratory system
Carcinogenicity	No evidence
Mutagenicity/Teratogenicity	No evidence
12. ECOLOGICAL INFORMATION	
General	Vegetation contacted with ammonia solution or exposed to significant vapour concentrations may suffer leaf scorching. In rivers, lakes etc. free ammonia is very toxic to aquatic life (pH>7.5-8.0 free ammonia is present and thus becomes toxic to aquatic life)
Mobility	Highly mobile due to infinite water solubility. Therefore rapidly diluted in water courses and leached from soils as ammonia or nitrate following bacterial activity.
Persistence/Degradability	Non persistent and rapidly degraded by bacterial action.
Bio-accumulation	Not considered to bio-accumulate
Aquatic Toxicity	Free ammonia in surface waters is very toxic to fish. However ammonium ions are not toxic. Therefore the pH of the water is important, free ammonia being formed above pH values of 7.5-8.0. Dependant on the species of fish, the lethal limit ranges from 1.2 to 5 mg/litre of free ammonia.
13. DISPOSAL CONSIDERATIONS	
General	Relevant authorities must be consulted before disposal of ammonia solution to drains or water courses. Spilled or surplus product is best disposed of by flushing to trade effluent system or sewer after neutralisation and dilution by copious amounts of water.
Container Disposal	Containers must be thoroughly washed out before change of use or disposal and the washings treated as above.
14. TRANSPORT INFORMATION	
UN No.	2672
Hazard Class	8 - corrosive substance
Packing Group	III - minor danger
EINECS No.	215-647-6

15. REGULATORY INFORMATION

CHIP Approved Supply List Index No.	007-001-01-2
Classification	C - corrosive Xi - irritant
Label Requirements	C - corrosive, N - dangerous to the environment
Risk Phrases	R34-37 - causes burns, irritating to respiratory system R50 - Very toxic to aquatic organisms
Safety Phrases	S7-26 keep container tightly closed, in case of contact with eyes rinse immediately with plenty of water and seek medical advice S45 - In case of accident or you feel unwell seek medical advice at once (show label where possible) S61 - Avoid release to the environment

16. OTHER INFORMATION

User Responsibility	<p>This Safety Data Sheet provides Health and Safety information. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information.</p> <p>The product information on this sheet is, to the best of this Company's knowledge, correct as at the date of publication. The user must be satisfied that the product is entirely suitable for the purpose for which it is being used. The Company accepts no liability for any loss or damage (other than that arising from death or personal injury caused by negligence if proved) resulting from reliance on this information.</p>
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