

SAFETY DATA SHEET

012

Product Name **R717 - ANHYDROUS AMMONIA****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

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Synonym(s) 012 - SDS NUMBER • AMMONIA • ANHYDROUS AMMONIA • GRADE >99.9% • PRODUCT CODES: 178, 230

Use(s) REFRIGERANT

SDS Date 26 Mar 2010

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO ASCC CRITERIA

RISK PHRASES

R10 Flammable.
R23 Toxic by inhalation.
R34 Causes burns.
R50 Very toxic to aquatic organisms.

SAFETY PHRASES

S16 Keep away from sources of ignition - No smoking.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).
S61 Avoid release to the environment. Refer to special instructions / safety data sheets.
S7/9 Keep container tightly closed and in a well ventilated place.
S9 Keep container in a well ventilated place.

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No.	1005	DG Class	2.3	Subsidiary Risk(s)	8
Packing Group	None Allocated	Hazchem Code	2RE	EPG	2B3

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
AMMONIA	N-H3	7664-41-7	>99.99%

4. FIRST AID MEASURES

Eye	Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.
Inhalation	If inhaled, remove from contaminated area. Remove contaminated clothing and check there is no obstruction to the airway. If breathing is weak or has ceased, give artificial respiration. Further treatment should be symptomatic and supportive. Consult doctor and recommend admission to hospital for observation. For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor.
Skin	Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30°C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.
Ingestion	Due to product form and application, ingestion is considered unlikely.
Advice to Doctor	Management of pulmonary oedema. Alkali burns, particularly to the eyes, can result in severe and sometimes permanent damage.
First Aid Facilities	Eye wash facilities and safety shower are recommended.

5. FIRE FIGHTING MEASURES

Flammability	Gas is flammable within certain vapour concentration limits and can form explosive mixtures with air. Gas is lighter than air and will generally disperse, however may concentrate in hollows or sumps. Dissolves exothermically in water. Corrosive to metals evolving flammable hydrogen. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones etc. when handling.
Fire and Explosion	Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot. Remove cool cylinders from the path of the fire. Evacuate the area if unable to keep cylinders cool. If a flame from the cylinder is impinging on flammable materials or other cylinders then evacuate the area. If the cylinder is standing alone and the flame is not impinging on flammable materials or other cylinders then let the flame continue until all gas has been consumed. Ensure working area is well ventilated before re-entry. Products of combustion include oxides of nitrogen which are hazardous.
Extinguishing	For small flames, use dry chemical, carbon dioxide or water spray. For large fires, use water fog or spray. Note that ammonia is readily absorbed by water and the resultant ammonia solution is alkaline. Prevent contamination of drains or waterways, absorb runoff with sand or similar.
Hazchem Code	2RE

6. ACCIDENTAL RELEASE MEASURES

Spillage	If the cylinder is leaking, eliminate all potential ignition sources and evacuate area of personnel. Prevent spreading of vapours through drains and ventilation systems. Inform manufacturer/supplier of leak. Use personal protective equipment. Carefully move material to a well ventilated remote area, then allow to discharge. Do not attempt to repair leaking valve or cylinder safety devices. Leaks - Due to its powerful and distinctive odour, any leakage of ammonia will be rapidly noticed and the general area of the source of leakage determined. Precise pin-pointing of the leak can be achieved by the application of wet litmus or phenolphthalein-impregnated paper to suspected areas; the alkalinity of the gas turns litmus blue and phenolphthalein red. A burning sulphur tape or sulphur dioxide gas can also be used for leak detection; the chemical reaction in this case producing dense white fumes in the presence of ammonia.
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7. STORAGE AND HANDLING

Storage	Do not store near sources of ignition or incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits. Outside or detached storage preferred. Keep out of direct sunlight. Refer to AS/NZ 2022: Anhydrous Ammonia - Storage and Handling and AS 4332: The Storage and Handling of Gases in Cylinders.
Handling	Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement. Use only in well-ventilated areas. When handling cylinders, use appropriate trolley. Do not drag or roll cylinders.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Product Name R717 - ANHYDROUS AMMONIA

Exposure Stds	Ingredient	Reference	TWA		STEL	
			ppm	mg/m3	ppm	mg/m3
	Ammonia	ASCC (AUS)	25	17	35	24

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Maintain vapour levels below the recommended exposure standard.

PPE Wear safety boots, leather gloves, coveralls, a Type K (Ammonia) respirator and safety glasses. When handling cylinders wear safety boots, safety glasses and abrasion-resistant gloves. Where an inhalation risk exists, wear an Air-line respirator or self Contained Breathing Apparatus (SCBA).



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS GAS OR LIQUID	Solubility (Water)	0.346 kg/kg
Odour	PUNGENT SUFFOCATING ODOUR	Specific Gravity	NOT APPLICABLE
pH	NOT APPLICABLE	% Volatiles	100 %
Vapour Pressure	960 kPa @ 25°C	Flammability	SLIGHTLY COMBUSTIBLE
Vapour Density	0.597 (Air = 1)	Flash Point	NOT RELEVANT
Boiling Point	-33.4°C	Upper Explosion Limit	28 %
Melting Point	NOT AVAILABLE	Lower Explosion Limit	15 %
Evaporation Rate	NOT APPLICABLE		
Autoignition Temperature	651°C	Critical Pressure	11277 kPa
Critical Temperature	132.4°C		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid shock, friction, heavy impact, heat, sparks, open flames and other ignition sources.
Material to Avoid	Ammonia is stable. Ammonia has potentially explosive or violent reactions with strong oxidisers, nitric acid, fluorine and nitrogen oxide. Ammonia forms explosive products with silver chloride, silver oxide, bromine, iodine and mercury. Ammonia is incompatible or has potentially hazardous reactions with silver, acetaldehyde, acrolein, boron, perchlorates, chlorine monoxide, chlorites, nitrogen tetroxide and sulphur. Ammonia is hygroscopic and will absorb moisture from the air to form an alkaline aqueous solution.
Decomposition	May evolve toxic gases if heated to decomposition.
Hazardous Reactions	Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Highly corrosive. Characteristic smell from 5 ppm and irritant effects usually provides good warning properties. Extremely irritating and corrosive. Over exposure to low levels may result in irritation with coughing and bronchospasm. Acute exposure to high levels may result in pulmonary oedema and asphyxia. Can be promptly fatal above 1500 ppm. Delayed reaction including pulmonary oedema may occur up to 24 hours after exposure. Chronic exposure to ammonia vapour may result in irritation to the eyes, nose and upper respiratory tract.
Eye	Highly corrosive. Gas and liquid are extremely irritating and corrosive. Mild concentrations of vapour will cause irritation, higher concentrations may cause burns, inflammation and swelling of the eyes with possible loss of vision. Persons with potential exposure should not wear contact lenses.
Inhalation	Inhalation of concentrations moderately above the exposure standard (25ppm) may result in irritation to the nose and throat. High level exposure may result in breathing difficulties, chest pain, coughing, pink frothy sputum and pulmonary oedema. Accumulation of fluid in the lungs can occur. Upper airway swelling may occur and lead to airway obstruction. Over exposure may predispose to the development of acute bronchitis and pneumonia.
Skin	Corrosive. Evaporating liquid may cause low temperatures of piping and equipment which could lead to cold burns.

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Ingestion Ingestion is considered unlikely due to product form.

Toxicity Data AMMONIA (7664-41-7)
 LC50 (Inhalation): 2000 ppm/4 hours (rat)
 LCLo (Inhalation): 5000 ppm/5 minutes (human)
 LD50 (Ingestion): 350 mg/kg (rat)
 TLo (Inhalation): 20 ppm (human)
 TDLo (Ingestion): 0.015 mL/kg (man)
 TDLo (Skin): 1000 mg/kg (human)

12. ECOLOGICAL INFORMATION

Environment When ammonia is dissolved in water the pH increases. Very toxic to plants and aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Cylinders should be returned to the manufacturer or supplier for disposal of contents.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

Transport Ensure cylinder is separated from driver and foodstuffs.



CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	AMMONIA, ANHYDROUS				
UN No.	1005	DG Class	2.3	Subsidiary Risk(s)	8
Packing Group	None Allocated	Hazchem Code	2RE	EPG	2B3

15. REGULATORY INFORMATION

Poison Schedule Classified as a Schedule 6 (S6) Poison using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

Application method: Gas withdrawal: regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment. Liquid withdrawal: appropriate refrigeration equipment or appropriate heat exchanger to vaporise the liquid.

- ABBREVIATIONS:
ADB - Air-Dry Basis.
BEI - Biological Exposure Indice(s)
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EINECS - European INventory of Existing Commercial chemical Substances.
IARC - International Agency for Research on Cancer.
M - moles per litre, a unit of concentration.
mg/m3 - Milligrams per cubic metre.
NOS - Not Otherwise Specified.
NTP - National Toxicology Program.
OSHA - Occupational Safety and Health Administration.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
TWA/ES - Time Weighted Average or Exposure Standard.

Product Name**R717 - ANHYDROUS AMMONIA****HEALTH EFFECTS FROM EXPOSURE:**

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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End of Report