

1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION

Product name: **ANHYDROUS AMMONIA**

Synonyms
ANHAMM-50K

Product Code
-

Bar Code
-

Recommended use: General purpose chemical.

Supplier: DuluxGroup (PNG) Pte. Ltd.
Street Address: Air Corps Road
Lae, Morobe 411,
Papua New Guinea
Telephone: +675 7444 9999

Emergency Telephone number: Australia +613 9663 2130

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) 7th edition.



Signal Word
Danger

Hazard Classifications

Flammable Gases - Category 2
Gases Under Pressure - Liquefied Gas
Acute Toxicity - Inhalation - Category 3
Skin Corrosion/Irritation - Category 1B
Eye Damage/Irritation - Category 1
Specific Target Organ Toxicity (Single Exposure) - Category 3 Respiratory Tract Irritation
Acute Hazard to the Aquatic Environment - Category 1
Chronic Hazard to the Aquatic Environment - Category 2

Hazard Statements

H221 Flammable gas.
H280 Contains gas under pressure; may explode if heated.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.
H335 May cause respiratory irritation.
H400 Very toxic to aquatic life.
H411 Toxic to aquatic life with long lasting effects.

Prevention Precautionary Statements

P102 Keep out of reach of children.
P103 Read carefully and follow all instructions.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260 Do not breathe fume, gas, mist, vapours or spray.
P264 Wash hands, face and all exposed skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.

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P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing including eye/face protection and suitable respirator.

Response Precautionary Statements

P101 If medical advice is needed, have product container or label at hand.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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/doctor/insert appropriate source of emergency medical advice.
P363 Wash contaminated clothing before reuse.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.
P391 Collect spillage.

Storage Precautionary Statements

P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P410+P403 Protect from sunlight. Store in a well-ventilated place.

Disposal Precautionary Statement

P501 Dispose of contents/container in accordance with local, regional, national and international regulations.

DANGEROUS GOOD CLASSIFICATION

Classified as Dangerous Goods by the criteria of the United Nations "Recommendations on the Transport of Dangerous Goods."

Dangerous Goods Class: 2.3
Subrisk 1: 8

3. COMPOSITION INFORMATION

CHEMICAL ENTITY	CAS NO	PROPORTION
Ammonia	7664-41-7	100 % (w/w)
		100%

4. FIRST AID MEASURES

Inhalation: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If breathing laboured and patient cyanotic (blue), ensure airways are clear and have a qualified person give oxygen through a facemask. If breathing has stopped apply artificial respiration at once. In the event of cardiac arrest, apply external cardiac massage. Seek immediate medical advice.

Skin Contact: If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If swelling, redness, blistering or irritation occurs seek medical assistance. For gross contamination, immediately drench with water and remove clothing. Continue to flush skin and hair with plenty of water. For skin burns, cover with a clean, dry dressing until medical help is available. If blistering occurs, do NOT break blisters. If swelling, redness, blistering, or irritation occurs seek medical assistance. For freeze burns, immediately flood burnt area with plenty of warm water (40 - 44 °C) and cover with a clean, dry dressing. Seek immediate medical

assistance.

Eye contact: Immediately irrigate with copious quantities of water for 15 minutes. Eyelids to be held open. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre. For freeze burns, Immediately irrigate with copious quantities of warm (40 - 44 °C) water for at least 15 minutes. Eyelids to be held open. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink. Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Seek medical advice.

PPE for First Aiders: Wear rubber boots, overalls, gloves, apron, face shield, air mask. Use with adequate ventilation. If inhalation risk exists, wear air-supplied mask meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Available information suggests that gloves made from butyl rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Notes to physician: Treat symptomatically. Delayed pulmonary oedema may result. Following severe exposure, the patient should be kept under medical supervision for at least 48 hours. Can cause corneal burns.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder). Water spray can be used to bring down the vapour but should not be sprayed on pools of liquid ammonia. If water is used, a minimum of 100 volumes of water must be available for each volume of ammonia.

Specific hazards: Contains gas under pressure; may explode if heated. Flammable gas. May form flammable vapour mixtures with air. Avoid all ignition sources. All potential sources of ignition (open flames, pilot lights, furnaces, spark producing switches and electrical equipment etc.) must be eliminated both in and near the work area. Do NOT smoke. Flammable concentrations of ammonia gas can accumulate in the vapour space of storage containers/vessels. Caution should be exercised when opening.

Fire fighting further advice: Ammonia: The main products of combustion in air, at or above 780 °C, are nitrogen and water with small amounts of nitrogen dioxide and ammonium nitrate. Ammonia decomposes into flammable hydrogen gas at approximately 450°C. May form flammable mixtures in air. The presence of oil or other combustible material will increase the fire hazard. Fatalities have occurred as a result of the explosive nature of the ammonia gas. If involved in a fire, keep containers cool with water spray. If safe to do so, remove containers from path of fire. Fire-fighters to wear full body protective clothing and self-contained breathing apparatus. Consider evacuation.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILLS

Wear protective equipment to prevent skin and eye contamination. Avoid inhalation of gas. If safe to do so, isolate the leak. Increase ventilation to assist with dispersion.

LARGE SPILLS

Clear area of all unprotected personnel. If safe to do so, isolate the leak. Increase ventilation to assist with dispersion. If contamination of crops, sewers or waterways has occurred advise local emergency services.

Dangerous Goods - Initial Emergency Response Guide No: 5

Additional information: GAS: For a small gas leak, increase ventilation and allow gas to vent to a safe area. For larger gas leaks, use fire hoses equipped with fog nozzles to disperse gas down-wind. Do NOT spray water directly on the leak or ammonia container. LIQUID: Large volumes of gas will evaporate from a liquid spill. For small liquid spills, increase ventilation and allow the liquid to volatilise to safe area. For large spills, cover liquid with protein foam 150 mm thick. DO NOT HOSE LIQUID AMMONIA TO DRAIN; contact with water will accelerate

vaporisation due to liberation of heat upon mixing with water.

7. HANDLING AND STORAGE

Handling: Avoid eye contact and skin contact. Avoid inhalation of vapour, mist or aerosols.

Storage: Store ammonia in a cool, well ventilated area, away from sources of heat or ignition and foodstuffs. Store away from oxidising agents, boron halides, acids, acid anhydrides, acid chlorides, halogens (e.g. chlorine), interhalogens, heavy metals and their salts, ethylene oxide, hypochlorous acid, acetaldehyde (etc., refer to section 10). Check cylinders regularly for leaks.

The transport of liquefied ammonia in a tank or bulk container made of quenched and tempered steel is prohibited unless the liquefied ammonia contains not less than 0.2% water mass. May be an explosion hazard, especially in confined spaces. Ensure pressure gauges and fittings are not made of copper, zinc or alloys (e.g. brass).

Refer to AS/NZS 2022 Anhydrous ammonia - Storage and handling.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National occupational exposure limits:

	TWA		STEL		NOTICES
	ppm	mg/m3	ppm	mg/m3	
Ammonia	25	17	35	24	-

As published by Safe Work Australia.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

If the directions for use on the product label are followed, exposure of individuals using the product should not exceed the above standard. The standard was created for workers who are routinely, potentially exposed during product manufacture.

Biological Limit Values: As per the "National Model Regulations for the Control of Workplace Hazardous Substances (Safe Work Australia)" the ingredients in this material do not have a Biological Limit Allocated.

Engineering Measures: Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Ammonia gas is generally lighter than air and will disperse under normal conditions. However, when ammonia liquid contacts air, the gas produced may be heavier than air. Prevent concentration in hollows or sumps. Do NOT enter confined spaces where vapour may have collected. An asphyxiant gas which can lead to the reduction of the oxygen concentration by displacement or dilution. The minimum oxygen content in air should be 18% by volume under normal atmospheric pressure.

If in the handling and application of this material, safe exposure levels could be exceeded, the use of engineering controls such as local exhaust ventilation must be considered and the results documented. If achieving safe exposure levels does not require engineering controls, then a detailed and documented risk assessment using the relevant Personal Protective Equipment (PPE) (refer to PPE section below) as a basis must be carried out to determine the minimum PPE requirements.

Personal Protection Equipment: RUBBER BOOTS, OVERALLS, GLOVES, APRON, FACE SHIELD, AIR MASK.

Wear rubber boots, overalls, gloves, apron, face shield, air mask. Use with adequate ventilation. If inhalation risk exists, wear air-supplied mask meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Available information suggests that gloves made from butyl rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Hygiene measures: Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Wash hands prior to eating, drinking or smoking. Avoid contact with clothing. Avoid eye contact and skin contact. Avoid inhalation of vapour, mist or aerosols. Ensure that eyewash stations and safety showers are close to the workstation location.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Gas
Colour:	Colourless
Odour:	Intensely irritating ammoniacal
Solubility:	Soluble in water.
Specific Gravity:	0.68 (-33 °C)
Relative Vapour Density (air=1):	0.6
Vapour Pressure (20 °C):	882 kPa @ 20°C
Flash Point (°C):	N Av
Flammability Limits (%):	15.5 - 25
Autoignition Temperature (°C):	669
Melting Point/Range (°C):	N Av
Boiling Point/Range (°C):	-33.4
pH:	11.6 (1M solution)
Viscosity:	N Av
Total VOC (g/Litre):	N Av
% Volatile by Volume:	100%

(Typical values only - consult specification sheet)
N Av = Not available, N App = Not applicable

10. STABILITY AND REACTIVITY

Chemical stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Ammonia dissolves exothermically in water. Can react explosively with chlorine and hypochlorites or other strong oxidising agents. Critical pressure = 11.4 MPa.

Conditions to avoid: Avoid exposure to heat, sources of ignition, and open flame. Avoid exposure to air as material is hygroscopic.

Incompatible materials: Oxidising agents, boron halides, acids, acid anhydrides, acid chlorides, halogens, interhalogens, heavy metals and their salts, ethylene oxide, acetaldehyde, calcium, hypochlorous acid, silver, acrolein, boron, perchlorates, chlorites, nitrogen tetroxide and sulphur.

Hazardous decomposition products: Hydrogen and oxides of nitrogen.

Hazardous reactions: Reacts violently with acids. Corrosive to copper, zinc, and their alloys.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Acute Effects

Inhalation: Toxic if inhaled. Material is an irritant to mucous membranes and respiratory tract.

Skin contact: Contact with skin will result in severe irritation. Corrosive to skin - may cause skin burns. Liquid splashes or spray may cause freeze burns.

Ingestion: Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain and chemical burns to the gastrointestinal tract.

Eye contact: A severe eye irritant. Corrosive to eyes: contact can cause corneal burns. Contamination of eyes can result in permanent injury. Liquid splashes or spray may cause freeze burns to the eye.

Acute toxicity

Inhalation: This material has been classified as a Category 3 Hazard. Acute toxicity estimate (based on ingredients): $500 < LC50 \leq 2,500$ ppm

Skin contact: This material has been classified as non-hazardous. Acute toxicity estimate (based on ingredients): $>2,000$ mg/Kg bw

Ingestion: This material has been classified as non-hazardous. Acute toxicity estimate (based on ingredients): $>2,000$ mg/Kg bw

Corrosion/Irritancy: Eye: this material has been classified as not corrosive or irritating to eyes. Skin: this material has been classified as a Category 1B Hazard (irreversible effects to skin).

Sensitisation: Inhalation: this material has been classified as not a respiratory sensitiser. Skin: this material has been classified as not a skin sensitiser.

Aspiration hazard: This material has been classified as non-hazardous.

Specific target organ toxicity (single exposure): This material has been classified as a Category 3 Hazard. Exposure via inhalation may result in respiratory irritation.

Chronic Toxicity

Mutagenicity: This material has been classified as non-hazardous.

Carcinogenicity: This material has been classified as non-hazardous.

Reproductive toxicity (including via lactation): This material has been classified as non-hazardous.

Specific target organ toxicity (repeat exposure): This material has been classified as non-hazardous.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

Acute aquatic hazard: This material has been classified as a Category Acute 1 Hazard. Acute toxicity estimate (based on ingredients): <1 mg/L

Long-term aquatic hazard: This material has been classified as a Category Chronic 2 Hazard. Non-rapidly or rapidly degradable substance for which there are adequate chronic toxicity data available OR in the absence of

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chronic toxicity data, Acute toxicity estimate (based on ingredients): 1 - 10 mg/L, where the substance is not rapidly degradable and/or BCF \geq 500 and/or log $K_{ow} \geq$ 4.

Ecotoxicity: No information available.

Persistence and degradability: No information available.

Bioaccumulative potential: No information available.

Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Persons conducting disposal, recycling or reclamation activities should ensure that appropriate personal protection equipment is used, see "Section 8. Exposure Controls and Personal Protection" of this SDS.

If possible material and its container should be recycled. If material or container cannot be recycled, dispose in accordance with local, regional, national and international Regulations.

14. TRANSPORT INFORMATION

ROAD AND RAIL TRANSPORT

Classified as Dangerous Goods by the criteria of the United Nations "Recommendations on the Transport of Dangerous Goods."



UN No: 1005
Dangerous Goods Class: 2.3
Subrisk 1: 8
Packing Group: None
Emergency Response Guide No: 5

Proper Shipping Name: AMMONIA, ANHYDROUS

Segregation Dangerous Goods: Not to be loaded with explosives (Class 1), flammable liquids (Class 3), spontaneously combustible substances (Class 4.2), oxidising agents (Class 5.1), organic peroxides (Class 5.2), food and food packaging in any quantity. Exemptions may apply.

MARINE TRANSPORT

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.



UN No: 1005
Dangerous Goods Class: 2.3
Subrisk 1: 8
Packing Group: None

Proper Shipping Name: AMMONIA, ANHYDROUS

AIR TRANSPORT

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

TRANSPORT PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in passenger and cargo aircraft.

15. REGULATORY INFORMATION

This material is not subject to the following international agreements:

Montreal Protocol (Ozone depleting substances)

The Stockholm Convention (Persistent Organic Pollutants)

The Rotterdam Convention (Prior Informed Consent)

Basel Convention (Hazardous Waste)

International Convention for the Prevention of Pollution from Ships (MARPOL)

16. OTHER INFORMATION

Reason for issue: Revised

This Safety Data Sheet has been prepared by Chemical Data Services Pty Ltd (chemdata.com.au) on behalf of its client.

Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This SDS summarises at the date of issue our best knowledge of the health and safety hazard information of the product, and in particular how to safely handle and use the product in the workplace. Since DuluxGroup (Australia) Pty Ltd and DuluxGroup (New Zealand) Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, review this SDS in the context of how the user intends to handle and use the product in the workplace.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request.