

Safety Data Sheet



1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **AMMONIUM NITRATE LIQUID**

Other name(s): Hot ammonium nitrate liquid, ANSOL

Recommended Use of the Chemical and Restrictions on Use Manufacture of emulsion explosives.

Supplier: Orica Australia Pty Ltd
ABN: 99 004 117 828
Street Address: 1 Nicholson Street
Melbourne 3000
Australia

Telephone Number: +61 3 9665 7111
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Emergency Telephone: **AUSTRALIA: 1 800 033 111 (ALL HOURS)**
INTERNATIONAL AUSTRALIA: +61 3 9663 2130 (ALL HOURS)

Please ensure you refer to the limitations of this Safety Data Sheet as set out in the "Other Information" section at the end of this Data Sheet.

2. HAZARDS IDENTIFICATION

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:

Oxidising liquids - Category 3
Eye Irritation - Category 2A

SIGNAL WORD: WARNING



Hazard Statement(s):

H272 May intensify fire; oxidizer.
H319 Causes serious eye irritation.

Precautionary Statement(s):

Prevention:

P210 Keep away from heat, sparks, open flames, hot surfaces. No smoking.
P220 Keep and store away from clothing, incompatible materials, combustible materials.
P221 Take any precaution to avoid mixing with combustibles and incompatible materials.
P264 Wash hands thoroughly after handling.
P280 Wear protective gloves, protective clothing, eye and face protection.

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**Response:**

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

P337+P313 If eye irritation persists: Get medical advice/attention.

P370+P378 In case of fire: Use extinguishing media as outlined in Section 5 of this Safety Data Sheet to extinguish.

Storage:

No storage statements.

Disposal:

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

Poisons Schedule (SUSMP): None allocated.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Product Description: Hot aqueous solution with not more than 0.2% combustible material and containing at least 7% water. Maximum content of chloride ions < 0.02%.

Components	CAS Number	Proportion	Hazard Codes
Ammonium nitrate	6484-52-2	>80%	H272 H319
Water	7732-18-5	7-15%	-
Buffering agents	-	<10%	-
Organics	-	<0.2%	-
Chlorine compounds	-	<0.02%	-

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor. CAUTION: the material is very hot (130°C maximum) so has the potential to cause severe thermal burns. Urgent hospital treatment is likely to be needed.

Inhalation:

Remove victim from area of 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 patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:

Caution - material can be very hot. For skin burns, immediately flood burnt area with plenty of water. For skin burns, cover with a clean, dry dressing until medical help is available.

If spilt on large areas of skin or hair, immediately drench with running water and remove clothing. Continue to wash skin and hair with plenty of water (and soap if material is insoluble) until advised to stop by the Poisons Information Centre or a doctor. Nitrates can be absorbed through cut, burnt or broken skin. Launder contaminated clothing before reuse.

Eye Contact:

Immediately wash in and around the eye area with large amounts of water for at least 15 minutes. Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport promptly to hospital or medical centre.

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Ingestion:

Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

Indication of immediate medical attention and special treatment needed:

Hot material can cause severe thermal and chemical burns due to temperature and oxidising properties. Treat initially as for scalds. Delayed shock is a possibility. This material contains up to 93% ammonium nitrate which can be absorbed through burnt skin. If exposure is suspected treat as outlined below. Clinical findings: The smooth muscle relaxant effect of nitrate salts may lead to headache, dizziness and marked hypotension.

Cyanosis is clinically detectable when approximately 15% of the haemoglobin has been converted to methaemoglobin (ie. ferric iron).

Symptoms such as headache, dizziness, weakness and dyspnoea occur when methaemoglobin concentrations are 30% to 40%; at levels of about 60%, stupor, convulsions, coma and respiratory paralysis occur and the blood is a chocolate brown colour. At higher levels death may result. Spectrophotometric analysis can determine the presence and concentration of methaemoglobin in blood.

Treatment:

1. Give 100% oxygen.
2. In cases of (a) ingestion: use gastric lavage, (b) contamination of skin (unburnt or burnt): continue washing to remove salts.
3. Observe blood pressure and treat hypotension if necessary.
4. When methaemoglobin concentrations exceed 40% or when symptoms are present, give methylene blue 1 to 2 mg/kg body weight in a 1% solution by slow intravenous injection. If cyanosis has not resolved within one hour a second dose of 2 mg/kg body weight may be given. The total dose should not exceed 7 mg/kg body weight as unwanted effects such as dyspnoea, chest pain, vomiting, diarrhoea, mental confusion and cyanosis may occur. Without treatment methaemoglobin levels of 20-30% revert to normal within 3 days.
5. Bed rest is required for methaemoglobin levels in excess of 40%.
6. Continue to monitor and give oxygen for at least two hours after treatment with methylene blue.
7. Consider transfer to centre where haemoperfusion can be performed to remove the nitrates from the blood if the condition of the patient is unstable.
8. Following inhalation of oxides of nitrogen the patient should be observed in hospital for 24 hours for delayed onset of pulmonary oedema.

Further observation for 2-3 weeks may be required to detect the onset of the inflammatory changes of bronchiolitis fibrosa obliterans.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:

Not combustible, however, if material is involved in a fire use: Water spray (large quantities).

Unsuitable Extinguishing Media:

DO NOT USE the following as extinguishing media: Dry agent (carbon dioxide, dry chemical powder). Extinguishing methods based on smothering are ineffective in the case of oxidising agents.

Hazchem or Emergency Action Code: 1Y

Specific hazards arising from the chemical:

Oxidizing substance. Non combustible, but will support combustion of other materials. Increases intensity of a fire, even in the absence of oxygen.

Special protective equipment and precautions for fire-fighters:

Caution - material can be very hot. Oxidising agent. Increases intensity of a fire. Decomposes on heating emitting toxic fumes, including those of oxides of nitrogen, ammonia and nitric acid. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire. Keep containers cool with water spray. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

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Substance No: 000022035801

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6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/Environmental precautions:

Clear area of all unprotected personnel. Slippery when spilt. Avoid accidents, clean up immediately. Shut off all possible sources of ignition. Do not allow the product to mix with combustible/organic materials. Caution: material can be very hot and contact may result in thermal burns. Wear protective equipment to prevent skin and eye contact and inhalation of vapours/dusts. If contamination of sewers or waterways has occurred advise local emergency services.

Personal precautions/Protective equipment/Methods and materials for containment and cleaning up:

Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). DO NOT use combustible material. Collect and seal in properly labelled containers or drums for disposal. DO NOT return spilled material to original container for re-use. Wash area down with excess water. Ensure that contaminated material (clothing, pallets) is thoroughly washed.

7. HANDLING AND STORAGE

Precautions for safe handling:

Hot ammonium nitrate liquid can cause severe burns due to its temperature and the oxidising properties of ammonium nitrate.

Avoid skin and eye contact and breathing in vapour, mists and aerosols.

A significant risk of exposure exists when clearing blocked lines or valves. Extreme care should be taken in this situation to avoid contact with the material.

Conditions for safe storage, including any incompatibilities:

Store in a compatible, insulated, heated, bunded tank away from combustible materials. Australian Standard/New Zealand Standard AS/NZS 4326 (2008) provides further guidance on storage. Avoid contamination with other chemicals. Store away from incompatible materials described in Section 10. Check regularly for leaks.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters: No value assigned for this specific material by Safe Work Australia. However, Workplace Exposure Standard(s) for possible constituents of vapour:

Ammonia: 8hr TWA = 17 mg/m³ (25 ppm), 15 min STEL = 24 mg/m³ (35 ppm)

Nitric acid: 8hr TWA = 5.2 mg/m³ (2 ppm), 15 min STEL = 10 mg/m³ (4 ppm)

Nitrogen dioxide: 8hr TWA = 5.6 mg/m³ (3 ppm), 15 min STEL = 9.4 mg/m³ (5 ppm)

Nitrous oxide (Dinitrogen monoxide): 8hr TWA = 45 mg/m³ (25 ppm)

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As published by Safe Work Australia Workplace Exposure Standards for Airborne Contaminants.

TWA - The time-weighted average airborne concentration of a particular substance when calculated over an eight-hour working day, for a five-day working week.

STEL (Short Term Exposure Limit) - the airborne concentration of a particular substance calculated as a time-weighted average over 15 minutes, which should not be exceeded at any time during a normal eight hour work day. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

These Workplace 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 workplace 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.

Appropriate engineering controls:

Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Workplace Exposure Standards. If inhalation risk exists: Use with local exhaust ventilation or while wearing air supplied mask.

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 Orica Personal Protection Guide information (refer to PPE section below) as a basis must be carried out to determine the minimum PPE requirements.

Individual protection measures, such as Personal Protective Equipment (PPE):

The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

OVERALLS, CHEMICAL GOGGLES, FACE SHIELD, GLOVES (Long), APRON, RUBBER BOOTS.



Wear overalls and boots or chemically resistant suit, face shield, elbow-length impervious gloves. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

If determined by a risk assessment an inhalation risk exists, wear an air supplied respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Hot (130°C max.) Liquid
Colour:	Clear , Colourless
Odour:	Depending on pH, material can have irritating odour of ammonia (high pH) or nitric acid (low pH).
Solubility:	Miscible with water.
Specific Gravity:	1.35
Relative Vapour Density (air=1):	Not available

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Vapour Pressure (20 °C):	Not available
Flash Point (°C):	Not applicable.
Flammability Limits (%):	Not applicable
Autoignition Temperature (°C):	Not available
% Volatile by Volume:	Not available
Solubility in water (g/L):	Miscible
Boiling Point/Range (°C):	Not available
Decomposition Point (°C):	Not available
pH:	5-7
Viscosity:	Not available
Evaporation Rate:	Not available

10. STABILITY AND REACTIVITY

Reactivity:	Oxidizing agents may cause vigorous reactions.
Chemical stability:	Ammonium nitrate is a powerful oxidising agent. When heated to decomposition (unconfined) it produces nitrous oxide, white ammonium nitrate fumes and water. When mixed with strong acids, and occasionally during blasting, it produces an irritating toxic brown gas, mostly of nitrogen dioxide. When molten may decompose violently due to shock or pressure.
Possibility of hazardous reactions:	Oxidizing agent. Supports combustion of other materials and increases intensity of a fire. Will react with organic materials, and reducing agents. Hazardous polymerisation will not occur.
Conditions to avoid:	Avoid contact with combustible chemicals. Avoid contact with other chemicals. Will react with organic materials and reducing agents. Avoid contact with strong acids.
Incompatible materials:	Incompatible with reducing agents. Incompatible with combustible materials. Incompatible with acids. Incompatible with alkalis. Incompatible with copper, zinc, brass and bronze.
Hazardous decomposition products:	Oxides of nitrogen. Ammonia. Nitric acid. Ammonium nitrate fumes.

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:

Ingestion:	Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain and chemical burns to the gastrointestinal tract. Swallowing large amounts may result in headaches, dizziness and a reduction in blood pressure (hypotension). Material can be very hot and exposure can result in severe thermal burns.
Eye contact:	Contact with the hot material can result in pain, thermal burns, and permanent injury. An eye irritant.
Skin contact:	Contact with hot material may cause skin burns. Can be absorbed through cut, broken, or burnt skin with resultant adverse effects. See effects as noted below.

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Inhalation: Vapour and processing fumes may cause irritation to mucous membranes of the respiratory tract, headache and nausea. May cause shortness of breath, severe headaches and lung effects. Inhalation of hot vapours may result in thermal burns to the respiratory tract.

Acute toxicity: No LD50 data available for the product. For the constituent AMMONIUM NITRATE: (1):
Oral LD50 (rat): 2217 mg/kg.

Chronic effects: No information available for the product.

Following the ingestion of nitrates in humans and animals methaemoglobinaemia has occurred. NITRATES: Absorption of nitrates by ingestion, inhalation or through burnt or broken skin may cause dilation of the blood vessels by direct smooth muscle relaxation with a subsequent lowering of blood pressure and may also cause breathing difficulties, blueness of the skin (cyanosis) and methaemoglobinaemia.

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

Bioaccumulative potential: Not expected to bioconcentrate or bioaccumulate.

Mobility in soil: The material is water soluble and may disperse in soil.

Aquatic toxicity: For AMMONIUM NITRATE: Ammonium nitrate was evaluated at 5, 10, 25 and 50 mg (NH₄⁺)/L. The fertility of *Daphnia magna* was decreased at 50 mg/L. Post embryonic growth of crustacea was impaired at 10, 25 and 50 mg/L.

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Refer to Waste Management Authority. Dispose of contents and container in accordance with local, regional, national, international regulations. Allow material to cool and solidify. Empty containers must be decontaminated by rinsing thoroughly with water. Rinsing water needs to be disposed of carefully.

14. TRANSPORT INFORMATION

Road and Rail Transport

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.



UN No: 2426
Transport Hazard Class: 5.1 Oxidizing Agent
Packing Group: III
Proper Shipping Name or Technical Name: HOT AMMONIUM NITRATE, LIQUID
Hazchem or Emergency Action Code: 1Y

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Marine Transport

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

UN No: 2426
Transport Hazard Class: 5.1 Oxidizing Agent
Proper Shipping Name or Technical Name: AMMONIUM NITRATE, LIQUID

IMDG EMS Fire: F-H
IMDG EMS Spill: S-Q

Air Transport

TRANSPORT PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in Passenger and Cargo Aircraft, and Cargo Aircraft Only.

15. REGULATORY INFORMATION

Classification:

This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:

Oxidising liquids - Category 3
Eye Irritation - Category 2A

Hazard Statement(s):

H272 May intensify fire; oxidizer.
H319 Causes serious eye irritation.

Poisons Schedule (SUSMP): None allocated.

All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

(1) 'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2017.

This safety data sheet has been prepared by Ixom Operations Pty Ltd Toxicology & SDS Services.

Reason(s) for Issue:

Alignment to Safe Work Australia requirements
Alignment to GHS requirements
Alignment to NZ EPA requirements

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This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since The Supplier cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Supplier representative or The Supplier at the contact details on page 1.

The Supplier's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.