

Section 1 – Identification of the Material and Supplier

Product Name

Ammonium nitrate emulsion

Other names

ANE, Spinifex Emulsion

Recommended use

Emulsion phase component for manufacture of explosives.

Company name

CSBP Limited

Address

Kwinana Beach Road, KWINANA

State

Western Australia

Postcode

6167

Telephone number

(08) 9411 8777 (Australia), +61 8 9411 8777 (Overseas)

Emergency telephone number

1800 093 333 (Australia), +61 8 9411 8444

Section 2 – Hazard Identification

Hazard Classification, including a statement of overall hazardous nature

HAZARDOUS SUBSTANCE.

Ammonium nitrate emulsion is hazardous according to Safe Work Australia; HAZARDOUS SUBSTANCE.

DANGEROUS GOODS.

Ammonium nitrate emulsion is classified for physicochemical hazards and specified as dangerous in the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code), 7th Edition, (FORS, 2007).

Classified as Security Sensitive Ammonium Nitrate under Federal Government legislation

GHS Classification(s)

| | |
|------------------|-------------|
| Oxidising Liquid | Category 3 |
| Eye Irritation | Category 2A |
| Carcinogenicity | Category 2 |

Label elements

Signal word

WARNING

Pictogram(s)



Hazard statement(s)

| | |
|---------------|--|
| H272 | May intensify fire (oxidizing agent). |
| H319 | Causes serious eye irritation |
| H351 | Suspected of causing cancer |
| AUH044 | Risk of explosion if heated under confinement. |
| AUH031 | Contact with acids liberates toxic gas. |



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Prevention statement(s)

- P201** Obtain special instructions before use
- P202** Do not handle until all safety precautions have been read and understood
- P210** Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P220** Keep/store away from clothing/incompatible materials/combustible materials.
- P221** Take any precaution to avoid mixing with combustibles/incompatible materials.
- P264** Wash thoroughly after handling.
- P280** Wear protective gloves/protective clothing/eye protection/face protection.

Response statement(s)

- P305 + P351 + P338** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P312** Call a POISON CENTER or doctor/physician if you feel unwell.
- P337 + P313** If eye irritation persists: Get medical advice/attention.
- P308+P313** If exposed or concerned: Get medical advise/attention
- P370 + P378** In case of fire: Use extinguishing media as outlined in Section 5 of this SDS to combat.

Storage statement(s)

- P405** Store locked up

Disposal statement(s)

- P501** Dispose of contents/container in accordance with relevant regulations.

Other hazards

No information provided.

Section 3 – Composition/Information on Ingredients

| Chemical identity of ingredients | Proportion of ingredients | CAS Number for ingredients |
|----------------------------------|---------------------------|----------------------------|
| Ammonium nitrate | > 60 % (wt/wt) | 6484-52-2 |
| Hydrocarbon (may contain Diesel) | < 10% (wt/wt) | na |
| Water | 10-30% (wt/wt) | 7732-18-5 |
| Non-hazardous additives | <10% (wt/wt) | na |

Section 4 – First Aid Measures

First Aid

Training on handling ammonium nitrate emulsion using this SDS should be provided before any ammonium nitrate emulsion handling or use commences.

First Aid Facilities

First aid procedures, equipment, medication and training for the treatment of injury by ammonium nitrate emulsion should be in place BEFORE the use commences.

Equipment in place should be:

- Safety shower and eyewash stations immediately accessible in the workplace;
- Eye-wash bottle;
- Fresh, clean cool drinking water;
- Oxygen;

- “Space” or thermal blankets for treating patients for shock;
- Personal protective equipment for use by first aid personnel.

FIRST AID PROCEDURES FOR DEALING WITH THIS PRODUCT AND EXPOSURE TO IT

1. Personal Protection By First Aid Personnel

First aid personnel providing first aid treatment to a patient injured by ammonium nitrate emulsion should observe the following precautions for their own personal protection:

- Avoid contact with ammonium nitrate emulsion by wearing protective gloves;
- Wear chemical goggles to prevent ammonium nitrate emulsion entering eyes;
- Wear P2 type canister respirator if rescue area is contaminated by airborne ammonium nitrate emulsion mist.

2. Swallowed

If person is conscious, rinse mouth thoroughly with water immediately and give water or milk to drink. DO NOT induce vomiting. Seek immediate medical assistance after swallowing.

3. Eyes

Immediately irrigate with copious quantities of water, while holding eyelids open, for at least 15 minutes. Seek medical immediate attention.

4. Skin

Wash affected areas with copious amounts of water. Remove all contaminated clothing and launder before re-use. Seek medical immediate attention.

5. Inhalation

Remove affected person from exposure to a well ventilated area. Keep warm and at rest. In emergency, if breathing is difficult give oxygen. If the affected person suffers cardiac arrest commence cardio-pulmonary resuscitation immediately. Seek urgent medical attention.

ADVICE TO DOCTOR.

Ammonium nitrate emulsion is transported at a temperature range of <50°C. If ingested, nitrates may be reduced to nitrites by intestinal bacteria. Nitrites may affect the blood (methaemoglobinaemia) and blood vessels (vasodilation and a fall in blood pressure). Effects peak within 30 minutes. Clinical signs of cyanosis appear before other symptoms because of the dark pigmentation of methaemoglobin. Institute cardiac monitoring, especially in patients with coronary, artery or pulmonary disease.

Long Term Complications

Possible carcinogenic properties arising from the diesel fuel component. Ammonium Nitrate itself has no known long term complication.

Further information about the treatment for exposure to this product can be obtained from the Poisons Information Centre on (08) 13 1126 (Australia only)

Section 5 – Fire Fighting Measures

Product flammability

Ammonium nitrate emulsion is not combustible under normal applications and is not considered a fire risk, but will support combustion in an existing fire by liberating oxygen – even if smothered. It is for this reason that fires involving ammonium nitrate emulsion cannot be extinguished by the prevention or air ingress (for example, smouldering with steam) because of the *in situ* provision of oxygen from the ammonium nitrate emulsion itself. Thermal decomposition may result in gases, such as oxides of nitrogen and ammonia, being produced.

Suitable extinguishing media

Water spray in large quantities. WARNING: explosion risk. 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.

Hazard from combustion products



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Decomposes on heating; emitting irritating white or orange & brown fumes of toxic oxides of nitrogen (NO_x)

Special protective precautions and equipment for fire fighters

Wear full protective clothing, including respiratory protection.

Inert chemical absorbent and substantial amounts of water will be required to clean up a large spill.

Portable showers and eyewash may also be needed.

Prevent run-off into drains and waterways.

WARNING: Explosion risk in case of fire, especially if contaminated or confined. An adjacent detonation may also involve the risk of explosion.

Fire-fighters to wear self-contained breathing apparatus and suitable protective clothing if there is a risk of exposure to products of combustion / decomposition.

WARNING: Explosion risk in case of fire. With an intense fire evacuate the area of all personnel to at least 1000 metres. If safe to do so, remove containers from path of fire. If safe to do so, keep containers and adjacent areas cool with water sprays. Prevent spillage or run-off from entering drains or water courses.

Hazchem Code

1Y (IMDG EMS Fire: F-H; IMDG EMS Spill: S-Q)

Section 6 – Accidental Release Measures

Emergency procedures

Hazardous conditions may result if an ammonium nitrate emulsion spill is managed improperly. Make plans in advance to handle possible emergencies, including obtaining stocks of inert absorbent materials, to avoid both human and environmental exposure. Always wear recommended personal protective equipment and respiratory protection.

Methods and Materials for containment and clean up

For all spills, evacuate unprotected personnel upwind and out of danger. Remove sources of heat and ignition. Restrict access to spill site. Any spillage should be promptly recovered. Avoid use of absorbents such as sand, earth, or vermiculite as it impacts on the ability to treat, recycle and/or dispose of the. Remove sources of heat and ignition.

Small Leaks

Material does not readily flow due to the high viscosity. Recover spilt material into a clean labelled open container for subsequent treatment, recycling and/or disposal

Large Spills

Material does not readily flow due to the high viscosity. Recover into suitable vessels such as IBCs for subsequent treatment, recycling and/or disposal.

Section 7 – Handling and Storage

Precautions for safe handling

Ammonium nitrate emulsion spills will not flow but tend to form puddles. The material will be at ambient temperature to warm (less than 50°C). Avoid washing down with water as the product contains hydrocarbons which may result in environmental impact if wash water enters waterways.

Conditions for safe storage, including any incompatibilities

Store in accordance with Australian Explosive Industry Safety Group (AEISG) Code of Practice for UN3375. Store away from sources of heat or fire, especially in a confined space – the heating may cause an explosion. Avoid storage and contamination with chlorine bleaches, pool chlorine and hypochlorite's as a reaction, leading to the formation of explosive nitrogen trichloride, may occur. Do not permit smoking and the use of naked lights in the storage area for ammonium nitrate emulsion.

This material is a Security Sensitive Ammonium Nitrate product and needs to be securely stored and accurately accounted for.

Section 8 – Exposure Controls/Personal Protection

National exposure standards

No exposure standard exists for this product. However exposure standards exist for the constituents.

Diesel: 5mg/m³ (stable aerosol) for 8 hours time-weighted average (TWA)

Diesel: 100 mg/m³, SKIN (total hydrocarbons, inhalable) for 8 hours time-weighted average (TWA)

Diesel: 200 mg/m³ (Vapour) 8 hours time-weighted average (TWA)

AN Decomposition products:

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

Source: ACGIH Exposure Standards.

Biological limit values

No data available.

Engineering controls

Provide ventilation where necessary.

Personal protective equipment

Personal protective equipment (PPE) should be used where other control measures are not practicable or adequate to control exposure. It should be chosen to prevent routine exposure and to protect workers in the case of accidental contact with ammonium nitrate emulsion.

Eye/face protection: Wear chemical safety goggles to prevent eye contact.

Skin protection: Wear PVC gloves when handling the product to prevent contact. Wear long trouser and long sleeves to prevent contact.

Respiratory protection: Use P2 type canister respirator where mist or fumes are a problem.

Personal hygiene: Change and wash clothing and PPE, if contaminated, or before storing and/or re-using.

Wash hands and face thoroughly after handling and before work breaks, eating, drinking, smoking and using toilet facilities.



Section 9 – Physical and Chemical Properties

Appearance (colour, physical form, shape)

Yellow to cream coloured emulsion. Ambient temperature.

Odour

Slight ammoniacal odour maybe present. Diesel odour may be detectable.

pH:

NA

Vapour pressure

NA

Vapour density

Not applicable.

Boiling point/range

Freezing/melting point



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| | |
|---|----|
| NA | NA |
| Solubility NA | |
| Specific gravity or density Specific gravity 1.2 to 1.5 @ 20°C | |
| Flash point and method of detecting flash point Ammonium nitrate emulsion has Flash Point of >61 °C (due to the diesel component – if present). | |
| Upper and lower flammable (explosive) limits in air Ammonium nitrate emulsion is not flammable. | |
| Ignition temperature Not determined. | |
| Viscosity 20,000 – 30,000 Centipoise | |

Section 10 – Stability and Reactivity

| |
|---|
| Chemical stability When stored and handled in accordance with AEISG Code of Practice, ammonium nitrate emulsion remains stable. |
| Conditions to avoid Store away from sources of heat or fire. Keep away from combustible materials and organic substances. Avoid storage and contamination with chlorine bleaches, pool chlorine and hypochlorites. Do not permit smoking and the use of naked lights in the storage area for ammonium nitrate solution. |
| Incompatible materials Ammonium nitrate emulsion is incompatible with copper, zinc, or their alloys (i.e., bronze, brass, galvanised metals, etc.), aluminium powder and mild steel. |
| Hazardous decomposition products When heated to decomposition (unconfined) produces nitrous oxide, white ammonium nitrate fumes and water. Other hazardous decomposition products include irritating toxic brown fumes of nitrogen oxides (NO _x). May evolve nitrogen oxides (nitrous oxide) and ammonium nitrate when heated to decomposition |
| Hazardous reactions Contamination of ammonium nitrate emulsion with chlorine bleaches, pool chlorine and hypochlorites may result in the formation of explosive nitrogen trichloride. When mixed with strong acid ammonium nitrate emulsion produces toxic brown nitrogen dioxide gas. Ammonium nitrate emulsion may react violently with nitrites, chlorates, chlorides and permanganates. |

Section 11 – Toxicological Information

| |
|---|
| <u>HEALTH EFFECTS</u> When handled in accordance with the guidelines in this safety data sheet, this product should not present any health effects. If this product is mishandled, symptoms that may arise are: Acute: Ammonium nitrate emulsion is loaded for transport at temperatures less than 50°C and should not result in thermal burns in contact with eyes and flesh. Inhalation: Material maybe irritant to the mucous membranes of the respiratory tract. Vapours (hydrocarbons) may cause dizziness, headaches and nausea. Skin: Contact with skin may cause irritation, with localised redness and subsequently dermatitis. Diesel may cause defatting of the skin after repeated or extended contact |
|---|

Eye:

Contact with the eye will cause mild to moderate irritation.

Swallowed:

Ingestion may result in symptoms such as nausea, vomiting and diarrhoea. Large amounts may also cause dilation of blood vessels by direct smooth muscle relaxation and methaemoglobinaemia (excessive conversion of haemoglobin to methaemoglobin, which is incapable of binding and carrying oxygen – methaemoglobin is formed when iron in the haem molecule is oxidised from the ferrous to the ferric state). Symptoms include dizziness, abdominal pain, vomiting, bloody diarrhoea, weakness, convulsions and collapse. LD₅₀ (Oral, rat) = 2,217 mg/kg, for ammonium nitrate.

Chronic:

Prolonged or repeated exposure to ANE may cause drying of the skin with cracking and irritation that may lead to dermatitis.

Diesel is suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Section 12 – Ecological Information

Ecotoxicity

Contamination of waterways is to be avoided.

Ammonium nitrate is of low toxicity to aquatic life and spills may cause algal blooms in static waters. Diesel component may result in impact to aquatic life.

Persistence and degradability

ANE is expected to have impaired degradability due to the stable emulsion. Once the emulsion has collapsed, the ammonium nitrate can be readily absorbed by the surrounding environment. The diesel and other additives are expected to persist.

Mobility

Not mobile due to the stable emulsion

Environmental fate (exposure)

Diesel: Floats on water, resulting in sheen on water surface that may impact on oxygen transfer.

Ammonium Nitrate:

Acute Toxicity to Fish

48 hr. LC₅₀ (*Cyprinus carpio*): 1.15 - 1.72 mg un-ionised NH₃/L; 95 – 102 mg total NH₃/L;

96 hr LC₅₀ (Chinook Salmon, rainbow trout, bluegill): 420 -1,360 mg NO₃⁻/L;

TL_m (Tadpoles): 910 mg NH₃/L.

Chronic Toxicity to Fish

7 day LC₅₀ (Fingerling rainbow trout): 1,065 mg/L.

Acute Toxicity to Aquatic Invertebrates

EC₅₀ (*Daphnia magna*): 555 mg/L; 124.9 mg total NH₃/L.

Chronic Toxicity to Invertebrates

Up to 7 days NOEC (*Bullia digitalis*): 300 mg/L.

Bioaccumulative potential

Ammonium nitrate (90% solution) does not show any bio-accumulation phenomena.

Section 13 – Disposal Considerations

Disposal methods and containers

Refer to local State Land Waste Management Authority. Refer to licenced waste disposal organisations for assistance.

Special precautions for landfill or incineration

No data available.



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Section 14 – Transport Information

UN Number

3375

UN Proper shipping name

Ammonium Nitrate Emulsion

Class and subsidiary risk

5.1 Oxidizing Agent

Packing group

None allocated

Special precautions for user

Not to be loaded with explosives (Class 1), flammable gases (Class 3), toxic gases (class 2.3), Flammable liquids (Class 3), flammable solids (Class 4.1), spontaneous combustible substances (Class 4.2), dangerous when wet substances (Class 4.3), organic peroxides (Class 5.2), toxic substances, where the toxic substances are fire risk substances (Class 6), radioactive substances (Class 7), corrosives (Class 8), miscellaneous dangerous goods, where the miscellaneous dangerous goods are fire risk substances (Class 9), and fire risk substances other than dangerous goods; however, exemptions apply.

Hazchem code

1Y

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

Section 15 – Regulatory Information

Australian regulatory information

Ammonium nitrate emulsion is hazardous according to Safe Work Australia; HAZARDOUS SUBSTANCE.

Additional national and/or international regulatory information

NA

Classifications

Safe Work Australia criteria are based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

Inventory listing(s)

AUSTRALIA: AICS (Australia Inventory of Chemical Substances)

All components are listed on the AICS; or are exempt.

Section 16 – Other Information

Key / legend to abbreviations and acronyms used in the MSDS

| | |
|--------------------|---|
| NOHSC | National Occupational Health and Safety Commission |
| SUSDP | Standard for the Uniform Scheduling of Drugs and Poisons |
| ES-TWA | Exposure Standard – Time weighted average |
| ES-STEL | Exposure Standard – Short term exposure level |
| ES-Peak | Exposure Standard – Peak level |
| FORS | Federal Office of Road and Safety |
| LC ₅₀ : | Lethal concentration 50, median lethal concentration |
| LD ₅₀ | Lethal dose 50. The single dose of a substance that causes the death of 50% of an animal population from exposure to the substance by any route other than inhalation |
| % (w/wt) | Percent amount on a weight per weight basis |



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| | |
|----------------|--|
| % (wt/vol) | Percent amount on a weight per volume basis |
| PPM | Parts per million |
| TLm | Median Toxic Limit is similar to LC but refers specifically to the concentration which kills 50% of the organisms, in other words the LC ₅₀ |
| Zone 1 Class 1 | An area in which an explosive gas atmosphere can be expected to occur periodically or occasionally during normal operation. (More than 10 hours per year but less than 1000 hours per year) |

Literature references

Occupational Safety and Health Regulations 1996, State Law Publisher, Western Australia.

Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals, Safe Work Australia, December 2015

Australian Code for the Transport of Dangerous Goods by Road and Rail, 7th Edition, Australian Government Publishing Service, Canberra, October 2015.

Chemical Rubber Handbook, D.R. Lide, CRC Press, 65th Edition, Boca Ratón, 1987.

Perry's Chemical Engineers' Handbook, R.H. Perry & D. Green, 6th Edition, McGraw-Hill, New York, 1984.

International Critical Tables of Numerical Data, Physics, Chemistry and Technology, National Research Council, 1st Edition, McGraw-Hill, New York, 1928.

Condensed Chemical Dictionary, G.G Hawley, 8th Edition, Van Nostrand Reinhold, New York, 1950.

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Patty's Industrial Hygiene and Toxicology, F.A. Patty, 3rd Revised Edition, G.D. & F.E. Clayton (Editors), John Wiley & Sons, New York, 1981.

Matheson Gas Data Book, W.Braker & A.L. Mossman, 6th Edition, Matheson Gas Products, Secaucus, 1980.

Encyclopaedia of Occupational Health and Safety, International Labour Office, 4th Edition, J.M. Stellman (Editor), Geneva, 1998

Kirk-Othmer Encyclopaedia of Chemical Technology, 4th Edition, Wiley InterScience, New York, 1997.

Ullmann's Encyclopaedia of Industrial Chemistry, F. Ullmann, 6th Edition, Wiley Interscience, New York, 2001.

Standard for the Uniform Scheduling of Drugs and Poisons, National Health and Medical Research Council, Australian Government Publishing Service, Canberra, 1992.

Poisons Act 1964, State Law Publisher, Western Australia, Reprinted 22 January 1999.

Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment, [NHSC:1003(1991)].

Hazardous Materials Handbook for Emergency Responders, Ongaard Training for Life, J. Varela (Editor), Van Nostrand Reinhold, New York, 1996.

Chemwatch www.chemwatch.net

Guidance for the Compilation of Safety Data Sheets for Fertilizer Materials, European Fertilizer Manufacturers Association, online at www.efma.org/Publications/Guidance/Index.asp

Sources for data

No data available.

Important Notes



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1. To the best of our knowledge this document complies with the Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice February 2016
2. This safety data sheet summarizes our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this material safety data sheet and consider the information in the context of how the product will be handled and used in the workplace, including in conjunction with other products.
3. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact the Safety and Emergency Services Department, CSBP Limited on (08) 9411 8777 (Australia), +61 8 9411 8777 (Overseas).
4. Our responsibility for products sold, is subject to our terms and conditions, a copy of which is sent to our customers, and is also available on request.
5. CSBP reserves the right to make change to safety data sheets without notice.