

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name ANFO
Synonyms AMMONIUM NITRATE FUEL OIL BLEND

1.2 Uses and uses advised against

Uses MINING EXPLOSIVE
Normally used as an explosive in mining and quarrying.

1.3 Details of the supplier of the product

Supplier name DOWNER EDI MINING - BLASTING SERVICES PTY LIMITED
Address 22 Cordelia Street, South Brisbane, QLD, 4101, AUSTRALIA
Telephone (07) 3026 6666
Fax (07) 3026 6070
Website <http://www.downergroup.com>

1.4 Emergency telephone numbers

Emergency 1800 680 402

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classifications Explosives: Division 1.1
Carcinogenicity: Category 2

2.2 Label elements

Signal word DANGER

Pictograms



Hazard statements

H201 Explosive; mass explosion hazard.
H351 Suspected of causing cancer.

Prevention statements

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.
P230 Keep wetted.
P240 Ground/bond container and receiving equipment.
P250 Do not subject to grinding/shock/friction/rough handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response statements

P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P370 + P380 In case of fire: Evacuate area.
P372 Explosion risk in case of fire.
P373 DO NOT fight fire when fire reaches explosives.

PRODUCT NAME ANFO**Storage statements**

P401 Store in accordance with relevant site and storage provisions.
P405 Store locked up.

Disposal statements

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

2.3 Other hazards

EXPLOSIVE HAZARD: Can detonate with severe impact or by heat or flame if confined. Keep away from heat sparks and avoid contact with combustible materials. Avoid shock and friction.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
AMMONIUM NITRATE	6484-52-2	229-347-8	>90%
FUEL OIL, NO. 2	68476-30-2	270-671-4	<10%
DYE(S)	-	-	<0.99%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator where an inhalation risk exists. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

Over exposure can cause nausea, vomiting, flushing of face and neck, headache, weakness, faintness and collapse. Severe over exposure may interfere with the ability of the blood to carry oxygen (methaemoglobinemia). This can cause headache, weakness, fatigue, dizziness and a blue colour to skin and lips. Higher levels may cause trouble breathing, collapse and even death.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically. Explosive material. Shrapnel from detonation may cause burns, wounds and bruises - treat symptomatically.

Treatment for nitrates:

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. Support respiratory and cardiovascular function. Treat symptomatically and as for exposure to nitrates. Over exposure may lead to methaemoglobinemia. Nitrates have a smooth muscle relaxant effect potentially resulting in hypotension.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

DO NOT attempt to extinguish burning explosives. Evacuate area immediately. Notify trained emergency response personnel.

5.2 Special hazards arising from the substance or mixture

EXPLOSIVE. Will explode under specific conditions. May evolve toxic gases (carbon/ nitrogen oxides, hydrocarbons) when heated to decomposition. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, etc when handling. CAUTION: Will explode if exposed to heat or with heavy impact.

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Do not attempt to fight fire. Use waterfog to cool intact containers and nearby storage areas. May explode from heat, pressure, friction or shock.

5.4 Hazchem code

E Evacuation of people in and around the immediate vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. CAUTION: Heating, impact or static charge may cause explosion.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Explosive Material. Do not clean-up or dispose except under supervision of a specialist. Contain spillage, collect and place in suitable containers for disposal in accordance with AS2187.2. Eliminate all sources of ignition.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in clean, well ventilated and dry magazine licensed for Class 1 Explosives. Segregate from all incompatible substances and foodstuffs. Ensure magazines are adequately labelled and protected from physical damage/shock or friction.

7.3 Specific end uses

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical explosion proof extraction ventilation is recommended.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear PVC or rubber gloves.
Body	Wear coveralls.
Respiratory	Wear appropriate respirator when ventilation is inadequate.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	WHITE TO PINK PRILLS
Odour	FUEL OIL ODOUR
Flammability	EXPLOSIVE
Flash point	NOT AVAILABLE
Boiling point	NOT AVAILABLE
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	1.5 - 6.5 (1% Solution)
Vapour density	NOT AVAILABLE
Specific gravity	0.70 - 0.90
Solubility (water)	SOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT AVAILABLE
Lower explosion limit	NOT AVAILABLE
Partition coefficient	NOT AVAILABLE
Autoignition temperature	> 100°C
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Potential for exothermic hazard.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid shock, friction, heavy impact, heat, sparks, open flames and other ignition sources. May explode at temperatures > 100°C.

10.5 Incompatible materials

May detonate if heated strongly or exposed to severe shock. Incompatible (explosively) with acids (e.g. nitric acid), metal powders, combustible materials, alkalis (e.g. sodium hydroxide), oxidising agents (e.g. hypochlorites), chloride salts, sulphur, urea, nitrites and reducing agents.

10.6 Hazardous decomposition products

May evolve toxic gases (carbon/ nitrogen oxides, hydrocarbons) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Information available for the ingredients:

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
AMMONIUM NITRATE	2950 mg/kg (rat)	> 5000 mg/kg (rat)	--

Skin Contact may result in mild irritation, redness and rash.
Eye Contact may result in mild irritation, lacrimation and redness.
Sensitisation Not classified as causing skin or respiratory sensitisation.
Mutagenicity Not classified as a mutagen.
Carcinogenicity Diesel fuels, distillate (light) is not classifiable as to its carcinogenicity to humans (IARC Group 3).
Reproductive Not classified as a reproductive toxin.
STOT - single exposure Over exposure may result in irritation of the nose and throat, coughing, chest pain, breathing difficulties, methaemoglobinemia and pulmonary oedema.
STOT - repeated exposure Repeated exposure to decomposition products may result in blood or respiratory disease.
Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

AQUATIC: Nitrates are nutrient in water. Spills may cause massive algae blooms in static water and affect local species population balance in the aquatic environment. Avoid contaminating waterways.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Waste must be disposed of in accordance with AS2187.2 as well as state regulatory and environmental legislation. Small quantities of damaged or deteriorated material may be destroyed by inclusion in a blast hole containing good explosives (by licensed personnel). Detonators should not be inserted into defective explosives. For large quantities, contact the manufacturer/supplier for additional information.
Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

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



	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	0082	0082	PROH
14.2 Proper Shipping Name	EXPLOSIVE, BLASTING, TYPE B	EXPLOSIVE, BLASTING, TYPE B	Air transport PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in passenger and cargo aircraft.
14.3 Transport hazard class	1.1D	1.1D	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

Not a Marine Pollutant

14.6 Special precautions for user

Hazchem code	E
GTEPG	EXP1
EMS	F-B, S-Y

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule	Classified as a Schedule 5 (S5) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).	
Classifications	Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals. The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].	
Hazard codes	Carc.	Carcinogen
	E	Explosive
Risk phrases	R2	Risk of explosion by shock, friction, fire or other sources of ignition.
	R40	Limited evidence of a carcinogenic effect.
Safety phrases	S34	Avoid shock and friction.
	S35	This material and its container must be disposed of in a safe way.
	S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
	S53	Avoid exposure - obtain special instructions before use.
Inventory listings	AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt.	

16. OTHER INFORMATION

Additional information	<p>EXPLOSIVES & BLASTING AGENTS: Refer to Local State and Federal legislation that specifically relates to the use of Explosives. Users of products described in this ChemAlert Report are advised to ensure familiarity and compliance with the appropriate legal requirements (e.g. Regulations) prior to the use of this product. Where any further information is required, users may contact their local authority in Explosives and Dangerous Goods.</p> <p>EXPLOSIONS: Fires involving explosives or explosive mixtures may undergo further explosions and rapid propagation. Police and emergency personnel should be notified immediately. Evacuate individuals to a safe sheltered area at least 800 metres away. If possible remove vehicles and further heat and ignition sources from the area. Do not return to areas until at least one hour after fire and explosions have ceased.</p> <p>EXPLOSIVES - DETONATION: If explosives are detonated on stony ground or in an area where debris is likely to become missiles, damage can be expected within 400 metres when three kilograms of explosives are detonated. For this reason it is recommended that explosives should be detonated in sand or earth that is free from stones.</p>
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EXPLOSIVES - BURNING SAFETY:

Note: Disposal in a blast with fresh explosives may be preferable to burning.

- (a) Make a sawdust (or newspaper) trail 450mm wide and ~20mm deep in the direction of the wind. The trail should be 2m longer than necessary.
- (b) Place the cartridges on the sawdust (or paper), they may be touching, but not piled on top of each other
- (c) Individual trails should be no closer than 2m and should not contain more than 12kgs of explosives.
- (d) Trails should be side by side, not in a line. No more than 4 should be set up at one time.
- (e) Remove explosives not being burnt, to at least 300m away, unless the material can be stored behind something substantial.
- (f) Thoroughly wet the trail with kerosene or diesel (never petrol or any other highly flammable liquid). Use at least 2L of fuel per 10m of trail.
- (g) Light the trail from a long rolled paper wick, place down wind and contact the 2m of trail which is not covered by explosives. The flame should blow away from the unburned explosives otherwise preheating and detonation may occur.
- (g) Use a plastic igniter if available instead of paper. Coil one end into the sawdust or under the paper and light the other end from a minimum distance of 7m away from the trail.
- (h) Move away at least 300m. Do not return for a period of at least 30mins after burning has finished.
- (j) If the fire goes out, do not approach for at least 15mins. Do not add kerosene or diesel oil unless certain that the flame is completely extinguished.
- (k) Bury the residue as it is poisonous to livestock.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, 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.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: form of product; 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 report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

PRODUCT NAME ANFO

Report status

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

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier 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, importer or supplier.

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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