

Safety Data Sheet



1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **SENATEL MAGNUM**

Recommended Use of the Chemical and Restrictions on Use Mining, quarrying and general blasting work where an energetic water-resistant explosive is required.

Supplier: Orica New Zealand Limited
Street Address: Brunnings Road
Carters Beach
Westport, 7892
New Zealand

Telephone Number: +64 3 788 8163
Emergency Telephone: **0 800 734 607 (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 a Dangerous Good according to NZS 5433:2012 Transport of Dangerous Goods on Land.

Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001.

SIGNAL WORD: DANGER

Subclasses:

Subclass 1.1 Category D

Subclass 6.1 Category D - Substances which are acutely toxic.

Subclass 6.3 Category A - Substances that are irritating to the skin.

Subclass 6.4 Category A - Substances that are irritating to the eye.

Subclass 6.8 Category C - Substances that produce toxic human reproductive or developmental effects on or via lactation.

Subclass 6.9 Category A - Substances that are toxic to human target organs or systems.

Subclass 9.1 Category A - Substances that are very ecotoxic in the aquatic environment.

Subclass 9.3 Category C - Substances that are harmful to terrestrial vertebrates.

The 'Hazardous Substances (Tracking) Regulations 2001' are applicable to this material.



Hazard Statement(s):

H201 Explosive; mass explosion hazard.

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H362 May cause harm to breast-fed children.

H372 Causes damage to organs through prolonged or repeated exposure.

H400 Very toxic to aquatic life.

H433 Harmful to terrestrial vertebrates.

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Precautionary Statement(s):

Prevention:

P102 Keep out of reach of children.
P103 Read label before use.
P201 Obtain special instructions before use.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P250 Do not subject to grinding/shock/friction/impact/electrical energy from extraneous source (lighting, static electricity, stray currents, galvanic electricity or electromagnetic radiation) or any form of heating.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P263 Avoid contact during pregnancy/while nursing.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:

P370+P380 In case of fire: Evacuate area.
P372 Explosion risk in case of fire.
P373 DO NOT fight fire when fire reaches explosives.
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P321 Specific treatment (see First Aid Measures on the Safety Data Sheet).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing before re-use.
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.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P314 Get medical advice/attention if you feel unwell.
P391 Collect spillage.

Storage:

P401 Store in accordance with Hazardous Substances (Class 1 to 5) Control Regulations 2001.

Disposal:

P501 In case of a substance that is in compliance with a HSNO approval other than a Part 6A (Group Standards) approval, a label must provide a description of one or more appropriate and achievable methods for the disposal of a substance in accordance with the Hazardous Substances (Disposal) Regulations 2001. This may also include any method of disposal that must be avoided.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Hazard Codes
Ammonium nitrate	6484-52-2	>60%	H272 H319
Sodium perchlorate	7601-89-0	<10%	H271 H302
Aluminium	7429-90-5	<10%	-
Non hazardous component(s)	-	to 100%	-

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.

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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 discoloration 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:

If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice. Nitrates can be absorbed through cut, burnt or broken skin. Launder contaminated clothing before reuse.

Eye Contact:

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

Ingestion:

Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek medical advice.

Indication of immediate medical attention and special treatment needed:

Treat symptomatically. Explosive material. Shrapnel from detonation may cause burns, wounds and bruises - treat symptomatically. May cause methemoglobinemia. Treat as for exposure to nitrates. For ammonium nitrate: 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.

Effects from exposure to nitrogen dioxide (possible decomposition component of blasting fumes) can include chest discomfort, shortness of breath and possible pulmonary oedema, the onset of which may be delayed.

5. FIRE FIGHTING MEASURES

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Suitable Extinguishing Media:

Do not fight fires involving explosives.

Hazchem or Emergency Action Code: E

Specific hazards arising from the chemical:

Explosive material. Avoid all ignition sources. On burning under confined or semi-confined conditions, some oxides of nitrogen and/or carbon will be present. Brown fumes indicate the presence of toxic oxides of nitrogen.

Special protective equipment and precautions for fire-fighters:

Explosive material. In case of a small fire, if actual explosive is not burning, carefully remove as much explosive as possible to a safe distance. Fire fighters to wear self-contained breathing apparatus if risk of exposure to vapour or products of combustion. However, if explosive is burning, evacuate area immediately. Do NOT fight fire. On burning under confined or semi-confined conditions, some oxides of nitrogen and/or carbon monoxide will be present. Brown fumes indicate the presence of toxic oxides of nitrogen.

A major fire may involve a risk of explosion. An adjacent detonation may also involve the risk of explosion. Mass explosion hazard. Severe explosive hazard when shocked or exposed to heat. Confinement of burning material may result in detonation.

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/Environmental precautions:

Shut off all possible sources of ignition. Clear area of all unprotected personnel. Avoid friction and impact. Wear protective equipment to prevent skin and eye contact. If contamination of sewers or waterways has occurred advise local emergency services.

In the case of a transport accident notify the Police, Regulatory Authorities and Orica Australia Pty Ltd (Telephone: 1800 033 111 -- 24 hour service Australia) and/or (Telephone: 0800 734 607 -- 24 hour service New Zealand).

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

Handle with care. Wear protective equipment to prevent skin and eye contact and breathing in vapours/dust. Contain - prevent run off into drains and waterways. Collect with non-metallic implements. Use a spark-free shovel. Collect in properly labelled containers, with loose fitting lids, for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling: Handle with care. Avoid skin and eye contact and breathing in vapour/dust. Avoid all contact with other chemicals. Keep out of reach of children. Do NOT subject the material to impact, friction between hard surfaces nor to any form of heating.

Conditions for safe storage, including any incompatibilities: Store material in a well ventilated magazine suitably licensed for Class 1.1D Explosives. Do not store detonators in an explosives magazine. Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from sources of heat or ignition. Store away from incompatible materials described in Section 10. Store away from strong acids, strong alkalis, nitrites, chlorates, chlorides and permanganates.

Ammonium Nitrate is incompatible with, and must be stored away from, tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, any bromate, chlorate, chlorite, hypochlorite or chloroisocyanurate or any inorganic nitrite. Keep containers closed when not in use - check regularly for spills.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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Workplace Exposure Standards: No value assigned for this specific material by the New Zealand Workplace Health & Safety Authority. However, Workplace Exposure Standard(s) for constituent(s) and decomposition product(s):

Oil mist, mineral: WES-TWA 5 mg/m³, WES-STEL 10 mg/m³

Paraffin wax fume: WES-TWA 2 mg/m³

Aluminium, as Al Metal dust: WES-TWA 10 mg/m³

Nitrogen dioxide: WES-TWA 3 ppm, 5.6 mg/m³; WES-STEL 5 ppm, 9.4 mg/m³

As published by the New Zealand Workplace Health & Safety Authority.

WES - TWA (Workplace Exposure Standard - Time Weighted Average) - The eight-hour, time-weighted average exposure standard is designed to protect the worker from the effects of long-term exposure.

WES - STEL (Workplace Exposure Standard - Short Term Exposure Limits) - The 15 minute average exposure standard. Applies to any 15 minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents. The WES-STEL is not an alternative to the WES-TWA; both short-term and eight-hour, time-weighted average exposures should be determined.

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 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.

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, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES.



Wear overalls, chemical goggles and impervious gloves. If determined by a risk assessment an inhalation risk exists, wear a respirator or an air-supplied mask meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Article , Cartridged into plastic 'sausages' with metal clips at both ends.
Colour:	Grey to cream mixture
Odour:	Negligible
Solubility:	Insoluble in water.
Specific Gravity:	1.15-1.35 @ 20°C
Relative Vapour Density (air=1):	Not available
Vapour Pressure (20 °C):	Not available
Flash Point (°C):	Not applicable.
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	Not available
Solubility in water (g/L):	Negligible
Melting Point/Range (°C):	Not available
Boiling Point/Range (°C):	Not available
Decomposition Point (°C):	Not available
pH:	Not available
Viscosity:	Not available
Evaporation Rate:	Not available

10. STABILITY AND REACTIVITY

Reactivity:	Explosive.
Chemical stability:	Explosive material. Avoid ignition sources, static electricity discharge and friction. Detonation may occur from heavy impact or excessive heating, particularly under confinement. Confinement of burning material could result in detonation.
Possibility of hazardous reactions:	Explosive material. A major fire may involve a risk of explosion. An adjacent detonation may also involve the risk of explosion. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. Explosion may result due to shock, friction, fire and other sources of ignition. Detonation may occur from heavy impact or excessive heating, particularly under confinement. Explosion creates the potential for shrapnel. Hazardous polymerisation will not occur.
Conditions to avoid:	Avoid exposure to heat, sources of ignition, and open flame. Avoid build up of static electricity. Avoid friction. Avoid contact with combustible substances. Avoid contact with other chemicals.
Incompatible materials:	Incompatible with strong acids. Incompatible with strong alkalis. Incompatible with combustible materials. Incompatible with permanganates, strong oxidising agents, acids and alkalis. Ammonium nitrate is a powerful oxidising agent; it is incompatible with tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, bromates, chlorates, chlorites, hypochlorites, perchlorates, permanganates, chloroisocyanurate, nitrites, powdered metals.
Hazardous decomposition products:	Oxides of carbon. Oxides of nitrogen. When heated to decomposition (unconfined) ammonium nitrate 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.

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, and abdominal pain. Swallowing large amounts may result in headaches, dizziness and a reduction in blood pressure (hypotension).
- Eye contact:** An eye irritant.
- Skin contact:** Contact with skin may result in irritation. Will have a degreasing action on the skin. Repeated or prolonged skin contact may lead to irritant contact dermatitis. Can be absorbed through cut, broken, or burnt skin with resultant adverse effects. See effects as noted under 'Inhalation'. Shrapnel from detonation may cause burns and wounds to the skin and eyes.
- Inhalation:** Material may be irritant to the mucous membranes of the respiratory tract (airways). Blasting may produce a toxic brown gas of nitrogen dioxide. Inhalation of the gas may result in chest discomfort, shortness of breath and possible pulmonary oedema, the onset of which may be delayed.
- Absorption of ammonium nitrate by inhalation, ingestion or through burnt or broken skin may cause dilation of blood vessels by direct smooth muscle relaxation and may also cause methaemoglobinaemia.

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

Serious eye damage/irritation: Irritant.

Chronic effects: No information available for the product.

In humans and animals methaemoglobinaemia has occurred under untreated circumstances following overexposure to nitrates. Absorption of nitrates by any route may cause dilation of blood vessels by direct smooth muscle relaxation.

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

Aquatic toxicity: 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 local government authority for disposal recommendations. Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose of material through a licensed waste contractor. Small quantities of damaged or deteriorated explosives may be destroyed by inclusion in a blast hole containing good explosive(s). For large quantities of damaged or deteriorated explosives notify Orica Australia Pty Ltd and/or Orica New Zealand Pty Ltd.

14. TRANSPORT INFORMATION

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Road and Rail Transport

Classified as a Dangerous Good according to NZS 5433:2012 Transport of Dangerous Goods on Land.



UN No: 0241
Transport Hazard Class: 1.1 D Explosive
Proper Shipping Name or Technical Name: EXPLOSIVE, BLASTING, TYPE E
Hazchem or Emergency Action Code: E

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: 0241
Transport Hazard Class: 1.1 D Explosive
Proper Shipping Name or Technical Name: EXPLOSIVE, BLASTING, TYPE E
IMDG EMS Fire: F-B
IMDG EMS Spill: S-X

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:

Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001.

Subclasses:

Subclass 1.1 Category D
Subclass 6.1 Category D - Substances which are acutely toxic.
Subclass 6.3 Category A - Substances that are irritating to the skin.
Subclass 6.4 Category A - Substances that are irritating to the eye.
Subclass 6.8 Category C - Substances that produce toxic human reproductive or developmental effects on or via lactation.
Subclass 6.9 Category A - Substances that are toxic to human target organs or systems.
Subclass 9.1 Category A - Substances that are very ecotoxic in the aquatic environment.
Subclass 9.3 Category C - Substances that are harmful to terrestrial vertebrates.

The 'Hazardous Substances (Tracking) Regulations 2001' are applicable to this material.

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Hazard Statement(s):

H201 Explosive; mass explosion hazard.

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H362 May cause harm to breast-fed children.

H372 Causes damage to organs through prolonged or repeated exposure.

H400 Very toxic to aquatic life.

H433 Harmful to terrestrial vertebrates.

16. OTHER INFORMATION

'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2016.

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

Reason(s) for Issue:

5 Yearly Revised Primary SDS

Alignment to Safe Work Australia requirements

Alignment to GHS requirements

Alignment to HSNO requirements

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 Orica Limited 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 Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as shipped is subject to the terms and conditions of sale, a copy of which is available upon request.