1. IDENTIFICATION

GHS Product Identifier
ELECTRIC DETONATORS

Product Code

Company Name
Dyno Nobel Asia Pacific Pty Limited

Address
282 Paringa Road
Gibson Island
Murarrie, QLD 4172
Australia

Telephone/Fax Number
Tel: (07) 3026 3900
Fax: (07) 3026 3999

Emergency phone number
1800 098 836

Recommended use of the chemical and restrictions on use
Initiating explosive charges

Additional Information
Note: This substance is an explosive product classified Class 1.1B Dangerous Good

2. HAZARD IDENTIFICATION

GHS classification of the substance/mixture
Classified as Hazardous according to the Globally Harmonised System of Classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia
Classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Acute Toxicity - Inhalation: Category 4
Acute Toxicity - Oral: Category 4
Carcinogenicity: Category 1
Explosives: Division 1.1
Germ Cell Mutagenicity: Category 2
Hazardous to the Aquatic Environment - Long-Term Hazard: Category 2
Sensitization - Skin: Category 1
STOT Repeated Exposure: Category 2
Toxic to Reproduction: Category 1A

Signal Word (s)
DANGER

Hazard Statement (s)
H201 Explosive; mass explosion hazard.
H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

**Pictogram(s)**
Exploding bomb, Exclamation mark, Health hazard, Environment

**Precautionary statement – Prevention**
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.
P230 Keep wetted with suitable material.
P240 Ground/bond container and receiving equipment.
P250 Do not subject to grinding/shock/friction.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash contaminated skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.

**Precautionary statement – Response**
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P314 Get medical advice/attention if you feel unwell.
P314 Get medical advice/attention if you feel unwell.
P330 Rinse mouth.
P333+P313 IF skin irritation or rash occurs: Get medical advice/attention.
P363 Wash contaminated clothing before reuse.
P370+P380 In case of fire: Evacuate area.
P372 Explosion risk in case of fire.
P373 DO NOT fight fire when fire reaches explosives.
P391 Collect spillage.

**Precautionary statement – Storage**
P401 Store according to manufacturer’s instructions and section 7 of this SDS.
P405 Store locked up.

**Precautionary statement – Disposal**
P501 Dispose of contents/container to an approved wasted disposal plant.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Information on Composition**
Contains barium salts and lead compounds.
Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentaerythritol tetranitrate (PETN)</td>
<td>78-11-5</td>
<td>30-60 %</td>
</tr>
<tr>
<td>Barium chromate</td>
<td>10294-40-3</td>
<td>10-30 %</td>
</tr>
<tr>
<td>Nitrocellulose</td>
<td>9004-70-0</td>
<td>0-9.99 %</td>
</tr>
<tr>
<td>Diazodinitrophenol (DDNP)</td>
<td>4682-03-5</td>
<td>0-9.99 %</td>
</tr>
<tr>
<td>Lead dioxide</td>
<td>1309-60-0</td>
<td>0-9.99 %</td>
</tr>
<tr>
<td>Potassium perchlorate</td>
<td>7778-74-7</td>
<td>0-9.99 %</td>
</tr>
<tr>
<td>Boron</td>
<td>7440-42-8</td>
<td>0-9.99 %</td>
</tr>
<tr>
<td>Tungsten</td>
<td>7440-33-7</td>
<td>0-9.99 %</td>
</tr>
</tbody>
</table>

4. FIRST-AID MEASURES

Inhalation
Unlikely route of exposure unless detonator is fired. If inhaled, remove affected person from contaminated area. Apply artificial respiration if not breathing. Seek medical attention.

Ingestion
Unlikely route of exposure unless detonator is fired. Do not induce vomiting. Wash out mouth thoroughly with water. Seek immediate medical attention.

Skin
Unlikely route of exposure unless detonator is fired. Remove all contaminated clothing immediately. Wash affected area thoroughly with soap and water. Wash contaminated clothing before reuse or discard. Seek medical attention.

Eye contact
Unlikely route of exposure unless detonator is fired. If in eyes, hold eyelids apart and flush the eyes continuously with running water. Remove contact lenses. Continue flushing for several minutes until all contaminants are washed out completely. Seek medical attention.

First Aid Facilities
Eyewash, safety shower and normal washroom facilities.

Advice to Doctor
Treat symptomatically.

Other Information
For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
DO NOT FIGHT FIRES. Immediately isolate area and evacuate personnel to a safe distance. Use only remote or fixed extinguishing systems (sprinklers).

Hazardso from Combustion Products
Under fire conditions this product may emit toxic and/or irritating fumes and gases including ammonia and oxides of nitrogen. As a result of detonation only: Nitrogen (N2), Carbon Monoxide (CO), Water (H2O), Nitrous Oxides (NOx), Lead (Pb) and various oxides and complex oxides of metals.

Specific Hazards Arising From The Chemical
Extreme risk of explosion by shock, friction, fire or other sources of ignition. In case of fire: Evacuate area. DO NOT fight fire when fire reaches explosives.

Hazchem Code
E

Decomposition Temperature
Not available
Precautions in connection with Fire
DO NOT fight fire when fire reaches explosives. In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use only remote or fixed extinguishing systems (sprinklers).

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures
Protect from all ignition sources. In case of fire evacuate all personnel to a safe distant area and allow to burn or fight fire remotely.

Avoid breathing fumes or gases from detonation of explosives. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean approved container. Ensure that a complete account of product has been made and is verified. Spilled product is extremely sensitive to initiation and may detonate. Surplus or defective explosives must not be placed in any waterway, thrown away, discarded or placed with rubbish.

Destruction of explosives must be carried out by suitably qualified personnel. If necessary, the relevant statutory authorities must be notified. In all circumstances, detonation is the preferred method of disposal.

The residue from spills and the burning of explosives may be toxic to livestock and/or wildlife. Dispose of waste according to applicable local and national regulations. If contamination of sewers or waterways occurs inform the local water and waste management authorities in accordance with local regulations.

7. HANDLING AND STORAGE

Precautions for Safe Handling
Only properly qualified and authorised personnel should handle and use explosives. Handle with great care. Unintended detonation of explosives or explosive devices can cause serious injury or death. Use in designated areas with adequate ventilation. Avoid sources of shock, friction, heat and ignition. Avoid contact with oxidising materials. Detonation in confined or unventilated areas may result in exposure to hazardous fumes or oxygen deficiency. Have emergency equipment (for spills, leaks, etc.) readily available. Label containers. Keep containers closed when not in use. Wear appropriate protective equipment to prevent inhalation, skin and eye contact. Maintain high standards of personal hygiene ie. washing hands prior to eating, drinking, smoking or using toilet facilities. Avoid exposure. Do not handle until all safety precautions have been read and understood.

It is recommended that pregnant or breastfeeding women should not handle this product unless adequate exposure protection can be assured at all times. Female personnel planning pregnancy should be made aware of the potential risks.

Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well-ventilated magazine licensed for Class 1.1B Explosives. Keep storage area free of sources of shock, friction, heat, ignition and combustible materials. Keep away from oxidising agents, strong acids, foodstuffs, and clothing. Only properly qualified and authorised personnel should handle and use explosives. Keep containers closed when not in use, securely sealed and protected against physical damage. Inspect regularly for deficiencies such as damage or leaks. Have appropriate fire extinguishers available in and near the storage area. Keep away from heat, sparks, open flames, ignition sources, hot surfaces. Take precautions against static electricity discharges. Use proper grounding procedures. Do not subject materials to impact, friction and strong shock. Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous. Ensure that storage conditions comply with applicable local and national regulations. For information on the design of the storeroom, reference should be made to Australian Standard AS 2187 Explosives - Storage, transport and use. Avoid undue force on detonator shell. Detonators should never be stored with explosives and must be stored separately in a detonator magazine or store. Keep away from heat, flame, ignition sources and avoid strong shock. Do not attempt to disassemble. Store and transport in accordance with Local, State and Federal requirements.

8. EXPOSURE CONTROLS/PERSOAL PROTECTION

Occupational exposure limit values
No exposure standards have been established for this material. However, the available exposure limits for ingredients are listed below:
Barium chromate
TWA: 0.05 mg/m³
NOTE: Sen
Lead Dioxide
TWA: 0.15 mg/m³ (lead, inorganic dusts and fumes)
Tungsten
TWA: 5 mg/m³
STEL: 10 mg/m³

TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.
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.

‘Sen’ Notice: The substance may cause sensitization by skin contact or by inhalation.

For dust created after detonations: the TWA exposure standards for dust not otherwise specified is 10 mg/m³. As with all chemicals, exposure should be kept to the lowest possible levels. TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week. Source: Safe Work Australia

**Biological Limit Values**
No biological limits allocated.

**Appropriate Engineering Controls**
This substance is hazardous and should be used with a local exhaust ventilation system, drawing vapours/particulates away from workers' breathing zone. A flame-proof exhaust ventilation system is required. If the engineering controls are not sufficient to maintain concentrations of vapours/mists below the exposure standards, suitable respiratory protection must be worn. Refer to relevant regulations for further information concerning ventilation requirements.
When test firing, ensure sufficient ventilation to keep airborne concentrations below exposure limits. Mechanical exhaust ventilation may be required.

**Respiratory Protection**
If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapour/particulate filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

**Eye Protection**
Safety glasses with side shields, chemical goggles or full-face shield as appropriate should be used. Final choice of appropriate eye/face protection will vary according to individual circumstances. Eye protection devices should conform to relevant regulations. Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337 - Eye Protectors for Industrial Applications.

**Hand Protection**
Wear gloves of impervious materials such as PVC or neoprene gloves. Final choice of appropriate gloves will vary according to individual circumstances. i.e. methods of handling or according to risk assessments undertaken. Occupational protective gloves should conform to relevant regulations.
Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.

**Body Protection**
Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled. When this product is handled the use of plastic aprons and rubber boots is recommended.
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Article - Containing Chemical</td>
<td>Appearance</td>
<td>Metal tube closed at one end, capped at the other with electric leg wires.</td>
</tr>
<tr>
<td>Colour</td>
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<td>Odour</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
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<td>Melting Point</td>
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<td>Boiling Point</td>
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<td>Specific Gravity</td>
<td>Not available</td>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>Not applicable</td>
<td>Vapour Density (Air=1)</td>
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<tr>
<td>Evaporation Rate</td>
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<td>Odour Threshold</td>
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<tr>
<td>Viscosity</td>
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<td>Partition Coefficient: n-octanol/water</td>
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<td>Flash Point</td>
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<td>Flammability</td>
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<tr>
<td>Oxidising Properties</td>
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</tr>
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</table>

10. STABILITY AND REACTIVITY

Chemical Stability
Extreme risk of explosion by shock, friction, fire or other sources of ignition.

Reactivity and Stability
Reacts with incompatible materials.

Conditions to Avoid
Shock, friction, heat, open flames and other sources of ignition.

Incompatible materials
Avoid contact with other explosives, pyrotechnics, solvents, acids, alkalis, reducing agents, amines, phosphorous, organic materials/compounds, finely divided combustible materials, finely divided metals and metal oxides.

Hazardous Decomposition Products
Thermal decomposition may result in the release of toxic and/or irritating fumes including ammonia and oxides of nitrogen.

Possibility of hazardous reactions
Highly reactive explosive. When detonated or heated to decomposition, this product will evolve highly toxic gases. As a result of detonation only: Nitrogen (N2), Carbon Monoxide (CO), Water (H2O), Nitrous Oxides (NOx), Lead (Pb) and various oxides and complex oxides of metals.

11. TOXICOLOGICAL INFORMATION

Toxicology Information
No toxicity data is available for the actual product. The main hazard is the possibility of exposure to lead fumes when test firing detonators in a confined space or poorly ventilated area.

Ingestion
Not a likely source of exposure. However, harmful if swallowed. Ingestion of this product may cause irritation to the mouth, throat, oesophagus and stomach with symptoms of nausea, abdominal discomfort, vomiting and diarrhoea.

Inhalation
Unlikely due to form of product. However, harmful if inhaled. Inhalation of product vapours can cause irritation of the nose, throat...
and respiratory system. Test firing of detonators in poorly ventilated areas can cause the presence of noxious fumes in the air. During test blasting, exposure to lead fumes is possible.

**Skin**
May be irritating to skin. The symptoms may include redness, itching and swelling. May cause an allergic skin reaction.

**Eye**
Not a likely source of exposure during normal industrial handling procedures. However injuries from accidental detonation of explosive devices can result in permanent eye damage or blindness. Particulates in eyes may cause irritation, redness, swelling, itching and tearing.

**Respiratory sensitisation**
Not expected to be a respiratory sensitizer.

**Skin Sensitisation**
May cause an allergic skin reaction.

**Germ cell mutagenicity**
Suspected of causing genetic defects. Classified as suspected to induce heritable mutations.

**Carcinogenicity**
May cause cancer. Classified as a Known or presumed human carcinogen. Chromium (VI) compounds are listed as a Group 1: Carcinogenic to humans according to International Agency for Research on Cancer (IARC). Lead compounds, inorganic are listed as a Group 2A: Probably carcinogenic to humans according to International Agency for Research on Cancer (IARC).

**Reproductive Toxicity**
May damage fertility or the unborn child. Classified as a Known or presumed human reproductive or developmental toxicant.

**STOT-single exposure**
Not expected to cause toxicity to a specific target organ.

**STOT-repeated exposure**
May cause damage to organs through prolonged or repeated exposure.

**Aspiration Hazard**
Not expected to be an aspiration hazard.

### 12. ECOLOGICAL INFORMATION

**Ecotoxicity**
Toxic to aquatic life with long lasting effects.

**Persistence and degradability**
Not available

**Mobility**
Not available

**Bioaccumulative Potential**
Not available

**Other Adverse Effects**
Not available

**Environmental Protection**
Do not discharge this material into waterways, drains and sewers.

### 13. DISPOSAL CONSIDERATIONS

**Disposal considerations**
Destruction of explosives must be carried out by suitably qualified personnel. If necessary, the relevant statutory authorities must be notified. In all circumstances, detonation is the preferred method of disposal. The explosives to be destroyed must be placed in direct contact with fresh priming charge in a hole and then adequately stemmed. No detonators are to be inserted into defective explosives. Personnel must be evacuated to a safe distance in accordance with relevant local regulations prior to initiation of the charge.
NOTE: Detonations in loose or stony ground may be expected to cause fly rock.

Detonators with shunted wires should be taped onto a cap sensitive cartridge explosive. Up to 100 detonators may be disposed of at one time. Shunted leg wires should be bundled together and the charge, primed with a good detonator, placed with the detonators pointing down into a hole which is at least 0.6 m deep. The charge is covered with paper or plastic and the hole backfilled with sand or stone-free soil. Personnel must be evacuated to a safe distance in accordance with relevant local regulations prior to initiation of the charge. After detonation the area is inspected for any unexploded detonator. Leg wires are to be disposed of in landfill in accordance with local regulations.

14. TRANSPORT INFORMATION

Transport Information

Road and Rail:
This material is classified as Dangerous Goods Class 1 Explosives.
Class 1 Dangerous Goods are incompatible in a placard load with any of the following:
- Division 2.1: Flammable gases
- Division 2.2: Non-flammable Non-toxic Gases
- Division 2.3: Toxic Gases
- Class 3: Flammable Liquids
- Division 4.1: Flammable Solids
- Division 4.2: Spontaneously Combustible Substances
- Division 4.3: Dangerous when wet Substances
- Division 5.1: Oxidising substances
- Division 5.2: Organic Peroxides
- Class 6: Toxic or Infectious Substances
- Class 7: Radioactive materials unless specifically exempted
- Class 8: Corrosive Substances
- Class 9: Miscellaneous substances
- Fire risk substances

Marine Transport (IMO/IMDG):
Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.
Class/Division: 1.1B
UN No: 0360
Proper Shipping Name: DETONATORS, ELECTRIC - (Lead dioxide) MARINE POLLUTANT
EMS : F-B,S-X
Special provisions: -

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.
Class/Division: 1.1B
UN No: 0360
Proper Shipping Name: DETONATORS, ELECTRIC
Packaging Instructions (passenger & cargo): Forbidden
Packaging Instructions (cargo only): Forbidden

U.N. Number
0030

UN proper shipping name
DETONATORS, ELECTRIC

Transport hazard class(es)
1.1B

Packing Group
see 'Other information' (*)

Hazchem Code
E
Special Precautions for User
Not available

IERG Number
02

IMDG Marine pollutant
Yes

Transport in Bulk
Not available

Other Information
(*) Unless specific provision to the contrary is made, the packagings used for explosives shall comply with at least the requirements for solids or liquids (as appropriate) of Packing Group II (medium danger).

Further information related to packaging, IBCS and Unit loads for explosives can be obtained from Australian Explosives Code.

15. REGULATORY INFORMATION

Regulatory information
Classified as Hazardous according to the Globally Harmonised System of classification and labelling of chemicals (GHS) including Work, Health and Safety regulations, Australia.
Not classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Poisons Schedule
Not Scheduled

16. OTHER INFORMATION

Date of preparation or last revision of SDS
SDS Reviewed: June 2016
Supersedes: May 2007

References
Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.
Standard for the Uniform Scheduling of Medicines and Poisons.
Australian Code for the Transport of Dangerous Goods by Road & Rail.
Model Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.
Workplace exposure standards for airborne contaminants.
Adopted biological exposure determinants, American Conference of Industrial Hygienists (ACGIH).
Globally Harmonised System of classification and labelling of chemicals.

Contact Person/Point
Dyno Nobel Asia Pacific Limited
Mt Thorley Technical Centre
Telephone: +61 2 6574 2500
Fax: +61 2 65 74 6849

DISCLAIMER: The information and suggestions above concern explosive products which should only be dealt with by persons having appropriate technical skills, training and licences. The results depend to a large degree on the conditions under which the products are stored, transported and used.
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