Material Safety Data Sheet

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product name: PLAIN DETONATORS

Synonyms:

CAS-No.:

Molecular Formula:

Supplier: INDIAN EXPLOSIVES LIMITED
Supplier Address: P.O. Indian Explosives(Gomia), Distt: Bokaro(Jharkhand)
Pin: 829 11
INDIA
Telephone: (06544)261241/244
Facsimile: (06544)261247

Emergency telephone number: (06544)261241(ALL HOURS)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Recommended use: Initiators for explosive charges. Normally used with safety fuse.

Appearance: Metal tubes (approx. 42mm in length, 6.4mm in diameter), closed at one end, containing explosive charge. Odourless.

<table>
<thead>
<tr>
<th>CHEMICAL ENTITY</th>
<th>CAS NO.</th>
<th>PROPORTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentaerythritol tetranitrate (PETN)</td>
<td>78-11-5</td>
<td>HIGH</td>
</tr>
<tr>
<td>Lead azide</td>
<td>13424-46-9</td>
<td>MED</td>
</tr>
<tr>
<td>Lead styphnate</td>
<td>15245-44-0</td>
<td>MED</td>
</tr>
<tr>
<td>Aluminium powder</td>
<td>7429-90-5</td>
<td>VLOW</td>
</tr>
</tbody>
</table>

PROPORTION (% weight per weight):
VHIGH >60, HIGH 30-60, MED 10-29, LOW 1-9, VLOW <1

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

3. HAZARDS IDENTIFICATION

Hazardous according to criteria of Worksafe Australia.

Hazard Category
Xn Harmful

R-phrase(s)
R 3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
Material Safety Data Sheet

R20/22 Harmful by inhalation and if swallowed.
R33 Danger of cumulative effects.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

Class: 1.1B Explosive

Poisons Schedule (Aust)/Toxic Substance (NZ): N/A - Not Applicable

4. FIRST AID MEASURES

The packaging of this material normally prevents any significant exposure. However if contact is suspected:

**Ingestion:** Rinse mouth with water. Give plenty of water to drink. If more than 15 minutes from a hospital, induce vomiting, preferably using Ipecac Syrup APF. Seek immediate medical assistance.

**Eye contact:** Irrigate with copious quantities of water for 15 minutes. In all cases of eye contamination it is a sensible precaution to seek medical advice.

**Skin contact:** Wash contaminated skin with plenty of soap and water. Remove contaminated clothing and wash before re-use. If irritation occurs seek medical advice.

**Inhalation:** Remove victim from exposure. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

**Notes to physician:** Treat symptomatically.

5. FIRE-FIGHTING MEASURES

**Specific hazards:** Explosive materials. Avoid all ignition sources.

**Fire fighting further advice:** Explosive solid. Severe detonation hazard when exposed to heat. In case of small fire where the actual detonators are not involved, carefully remove the detonators to a safe distance; otherwise, evacuate area immediately and allow to burn.

6. ACCIDENTAL RELEASE MEASURES

Shut off all possible sources of ignition. Collect and seal in properly labelled drums for disposal. In the case of a transport accident notify the State Police, Controller of Explosives and IEL (Telephone 06544/261241 - 24 hour service).

7. HANDLING AND STORAGE
8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**National occupational exposure limits**
No value assigned for this specific material by the National Occupational Health and Safety Commission (Worksafe Australia).

However, Exposure Standard for lead fumes (possibility of exposure when test firing in a poorly ventilated area):

<table>
<thead>
<tr>
<th></th>
<th>TWA ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead fumes, as Pb</td>
<td>-</td>
<td>0.15</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

As published by the National Occupational Health and Safety Commission (Worksafe Australia).

TWA - the Time-Weighted Average airborne concentrations over an eight-hour working day, for a five-day working week over an entire working life.

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 work day. According to current knowledge these concentrations should neither impair the health of, nor cause undue discomfort to, nearly all workers.

These 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. 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.

**Engineering measures:** When test firing, ensure ventilation is adequate and that concentrations of components are controlled below quoted Exposure Standards. Natural ventilation should be adequate under normal use conditions.

**Personal protection equipment:** Orica Personal Protection Guide No.1, 1998: A - OVERALLS, SAFETY SHOES.

Avoid skin and eye contact and inhalation of dust to contents of metal tube. Containment of charge within metal tube prevents exposure under normal use conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

**Form / Colour / Odour:** Metal tubes (approx. 42mm in length, 6.4mm in diameter), closed at one end, containing explosive charge. Odourless.

**Solubility:** Insoluble in water.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity (20°C)</td>
<td>N Av</td>
</tr>
<tr>
<td>Rel Vapour Density (air=1)</td>
<td>N App</td>
</tr>
<tr>
<td>Melting Point (°C)</td>
<td>N App</td>
</tr>
<tr>
<td>Boiling Point (°C)</td>
<td>N App</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Stability: Detonation can occur from impact, friction or excessive heating.

11. TOXICOLOGICAL INFORMATION

Main symptoms: No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms that may arise if the product is mishandled are:

Ingestion: Swallowing of the material can result in the formation of hydrazoic acid which can cause a lowering of blood pressure, violent headaches, dizziness, weakness, blurred vision, nausea, vomiting, respiratory distress, slowing of heart rate, central nervous system depression, convulsions, unconsciousness and possible death. (1)

Eye contact: Not expected to be an eye irritant. Exposure to the explosive charge inside metal tube may cause eye irritation.

Skin contact: Not expected to be a skin irritant. Contact of explosive charge inside metal tube with skin may result in irritation.

Inhalation: Not expected to cause respiratory irritation. Test firing of detonators in poorly ventilated areas can cause presence of lead fume in air. Lead fume may be irritant to mucous membranes and respiratory tract.

Long Term Effects: Repeated or prolonged exposure to lead compounds (by any route) can result in lead poisoning with possible effects such as abdominal pain, colic, constipation and/or diarrhoea, loss of appetite, weight loss, metallic taste in the mouth, nausea, vomiting, irritability, a blue line on the gums, weakness, insomnia, joint and muscle pain and weakness, headache and tremor. Absorption of lead over a period of time can produce adverse effects on the blood and central nervous system. (1)

Acute toxicity / Chronic toxicity
No LD50 data available for product. Exposure to explosive charge material unlikely. The main hazard is the possibility of exposure to lead fumes when test firing detonators in a poorly ventilated area.

For the component Lead azide (1):
Some azides have been reported as potent vasodilators, causing hypotension by direct action smooth muscle relaxation. Azide has been reported as causing neurological injury (to nerve fibres and brain) following repeated exposure.
The main hazard of lead compounds is due to their effects as cumulative poisons - significant absorption over a period of time may produce adverse effects as noted under 'Toxicological Information' due to the accumulation of lead in the body.
Limited toxicological information is available for this material thus emphasising the need for care in handling.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

13. DISPOSAL CONSIDERATIONS

For small quantities: Place in a blast hole and explode during blasting. Large quantities should be returned to Indian Explosives Ltd. or be disposed of in conjunction with the relevant State Dangerous Goods Branch. Do not move detonators showing obvious signs of deterioration. Contact Indian Explosives Ltd or the relevant State Dangerous Goods Branch.

14. TRANSPORT INFORMATION

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

UN-No: 0029
Class: 1.1B Explosive
Hazchem code: E

Proper shipping name: DETONATORS, NON-ELECTRIC

Segregation Dangerous Goods: Explosives are not normally loaded with dangerous goods of other classes and fire risk substances, however exemptions may apply.

15. REGULATORY INFORMATION

Hazardous according to criteria of Worksafe Australia.

Hazard Category
Xn Harmful

R-phrase(s)
R 3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
R20/22 Harmful by inhalation and if swallowed.
R33 Danger of cumulative effects.

S-phrase(s)
S13 Keep away from food, drink and animal feeding stuffs.
S20/21 When using, do not eat, drink or smoke.
S33 Take precautionary measures against static discharges.
S34 Avoid shock and friction.
S35 This material and its container must be disposed of in a safe way.
16. OTHER INFORMATION

Literary reference

(1) Material Safety Data Sheet - Lead azide - dry, CDS 000023937001;
Orica Australia Pty Ltd; 07/96.
This Material Safety Data Sheet has been prepared by SHE Pacific Pty Ltd
on behalf of Orica Ltd and its subsidiary companies.
Contact Point: SHE Pacific Pty Ltd, MSDS Services
Within Australia: Telephone 1 800 624 132
                Facsimile (03) 9665 7929
Outside Australia: Telephone +61 3 9665 7500
                   Facsimile +61 3 9665 7929

Reason(s) For Issue: Change in Health Effects Data; Change in Personal Protection
Requirements.
Safety Data Sheets are updated frequently. Please ensure that you have
a current copy.

This MSDS summarises at the date of issue our best knowledge of the health and safety hazard information of
the product, and in particular how to safely handle and use the product in the workplace. Since IEL and
its subsidiaries cannot anticipate or control the conditions under which the product may be used, each user
must, prior to usage, review this MSDS in the context of how the user intends to handle and use the product in
the workplace.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user
should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to
our customers and is also available upon request.