

<b>C DET Explosive Industries Private Limited</b>	Document No.: CDET/MSDS/02/00
<b>Material Safety Data Sheet</b>	<b>Issue Date:</b> 10.10.06
<b>Electric Detonators</b>	<b>Page</b> 1 of 8

**This document conforms to**

**EC Directive 91/155/EEC**

**and**

**Regulation 6 of the Chemicals (Hazard Information & Packaging for Supply) Regulations 2002**

**The products described herein are explosive in UN Dangerous Goods, Class 1 and should not be handled or used until the regulations concerning possession and use have been carefully studied and fully understood for this Class.**

	Compiled by	Approved by
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Occupation	Director and Chief Technical Officer	Director and Chief Executive Officer
Date	10/10/2006	10/10/2006

**1. PRODUCT NOMENCLATURE/IDENTIFICATION**

**Commercial Names:** Instantaneous Electric Detonator, Short Delay Detonator, Long Delay Detonator, Millisecond Delay Detonator, Long Period Delay Detonator

**Manufactured by:** C DET Explosive Industries Private Limited  
Factory  
Talegaon (S.P.), Taluka - Ashti  
Dist.: Wardha - 442204 (INDIA)  
Tel.: 91- 7156 – 236356, Fax.: 91 - 7156 - 236357  
Sales & Technical Support Office  
2<sup>nd</sup> Floor, 79, Shivaji Nagar,  
Nagpur - 440 010 (INDIA)  
Tel.: 91 - 0712- 2249121/22, Fax.: 91 - 0712- 2247480  
Email : cdetex\_ngp@sancharnet.in

**Area Distributor:**  
(If any)

**Local Importer:**  
(If any)

**Emergency No:** 91-9422113387

**2. COMPOSITION AND INFORMATION ON INGREDIENTS**

Material	CAS No.	Hazard Symbols	R phrases	S phrases
PETN	78-11-5	E	3	2-35
Lead Azide	13424-46-9	E; T; N; Xn	61-3-20/22-33-50/53-62	
Lead Styphnate	15245-44-0	E; T; N; Xn	61-3-20/22-33-50/53-62	
Delay Charge		E	2	35

**EINECS Number:** Does not apply to explosives

**Risk Phrases:** R2 Risk of explosion by shock, friction, fire or other sources of ignition.

**Safety Phrases:** S1 /2 Keep locked up and out of reach of children  
S3/9 Keep in a cool, well ventilated place  
S15 Keep away from heat  
S16 Keep away from sources of ignition  
S36/37 Wear suitable protective clothing  
S47 Keep at temperature not exceeding 50°C  
S60 This material and its container must be disposed of as hazardous waste

**3. HAZARDS IDENTIFICATION**

<b>Danger:</b>	Explosive UN Classification 1.1 B - mass explosion hazard with projection of debris
<b>Flammable:</b>	Not combustible at ambient temperature and pressure
<b>Toxic:</b>	Low toxicity to plant and animal life - only on exposure to internal components
<b>Irritant:</b>	No issue unless exposure to internal components

Do not tamper with the product or subject it to heavy impact or friction.  
Do not attempt to take apart or cut detonator shell.

**4. FIRST AID MEASURES**

The construction of these articles normally prevents any possibility of chemical contamination.

<b>Ingestion:</b>	Not Applicable
<b>Eye contact:</b>	In cases of eye injury or contamination during use of the product, seek medical advice.
<b>Skin contact:</b>	Not applicable. Seek immediate medical advice if exposure to detonator contents has occurred.
<b>Inhalation:</b>	If exposed to fumes from detonation in a poorly ventilated area, remove the victim from exposure and loosen clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.
<b>Notes to physician:</b>	Treat symptomatically. Detonator assemblies are explosive - handle with care. Long term exposure to detonation fumes may result in lead poisoning.

**5. FIRE FIGHTING MEASURES**

**Specific hazards:** Explosive material. Avoid all ignition sources and stray currents

**Fire fighting advice:** Fire represents the principal risk to safety due to the likelihood of burning to detonation.

In the case of a small fire where the detonators are not directly involved, and without risk to safety, carefully remove the detonators to a safe distance.

Otherwise, for example in cases where the detonators are involved and the packaging is burning, do not attempt to fight the fire, immediately evacuate the area and allow to burn. Seek shelter atleast 300 metres away.

**5. (cont'd...)**

<b>Extinguishing Media:</b>	Water spray or foam - to be used only when there is no danger of explosion and under expert guidance.
<b>Extinguishing Media not to be used:</b>	All other media
<b>Exposure Hazards:</b>	Projectiles from exploding detonators, lead fume, oxides of nitrogen, carbon monoxide
<b>Combustion Products:</b>	As above plus - metallic oxides (aluminium, zinc, copper), nitrogen, carbon dioxide
<b>Protective Equipment:</b>	Fire fighters to wear self-contained breathing apparatus if risk of exposure to vapour or products of combustion. Eye protection is also advised, in addition to normal protective suits and headgear.

**6. ACCIDENTAL RELEASE MEASURES****Personal Precautions:**

Removal of Ignition Sources:	Yes
Provide Adequate Ventilation:	Yes
Provide Respiratory Equipment:	Only in fire situation
Control dust:	Not applicable
Prevent Eye and Skin Contact:	Only in event of fire

**Environmental Precautions:**

Keep away from drains:	Yes
Keep away from groundwater:	Only in fire situation
Keep away from soil:	Only in fire situation
Alert Neighbourhood:	Only on advice of Emergency Services

**Clean Up Methods:**

Use of Absorbent Material:	Not applicable. Collect and seal the detonators in labelled containers for disposal
Use Binder:	No
Dilute with water:	No
Never use with:	Combustibles
Neutralise with:	Not applicable

In addition, refer to information under Sections 8 & 13.

Note: In the event of a transport incident, notify Emergency Services - Police, Fire, Ambulance and call the Manufacturer's Emergency Response number.

**7. HANDLING AND STORAGE****Precautions for:**

Safe Handling:	Handle with care - avoid rough handling. Avoid impact, friction, sparks or heat. Wear eye protection
Ventilation:	Not applicable
Dust:	Not applicable
Aerosol Effects:	Not applicable
Fire:	Refer to local emergency procedure (also refer to information under Section 5

Note: Care should be exercised when handling detonators in the proximity of any electrical apparatus capable of producing currents of this order, radio equipment and areas of static electricity to avoid current pick up and possible premature detonation.

Avoid build up of electrostatic charge when handling ordinary detonators, as premature initiation may occur if excessive charge is allowed to accumulate. Keep protected from lightning discharges or, if impossible to attain, leave the area until risk of lightning has receded.

Do not attempt to cut open, drill, bend or strike with any degree of force. Do not force into primers or detonator pockets in cast products. Keep from all sources of radio energy and sources of electromagnetic radiation.

**Storage Precautions:**

Incompatible materials:	Do not store with flammable / combustible materials Do not store with explosives of different Compatibility Group Detonators must be stored separately in a detonator magazine or store
Temperature:	Avoid external heat sources in excess of 50°C Prolonged exposure to temperatures above 50°C may lead to deterioration of the internal components
Humidity:	Avoid storage in humid conditions. Store in a dry and appropriately licensed magazine
Electrical Equipment:	To appropriate electrical classification Battery operated equipment prohibited
Static Electricity:	Normal requirements for licensed storage buildings - product has high level of immunity to static electricity
Quantity Limits:	As per licensed storage capacity

**8. EXPOSURE CONTROLS PERSONAL PROTECTION**

Respiratory Protection:	Not required - only in event of exposure to fume due to fire
Hand Protection:	Not required
Eye Protection:	Recommended
Skin protection:	Not required
Other Protective Clothing:	Not required

**9. PHYSICAL CHEMICAL PROPERTIES**

Appearance & Physical Form:	Metal tube (Aluminium) with pair of leading wires attached to one end through PVC plug and closed at the other end. Contains pressed explosive charges.
Colour / Odour	The detonator assembly is odourless.
pH of substance/solution:	Not applicable
Boiling point/boiling range:	Not applicable
Melting point/melting range:	Not applicable
Flash point:	Not applicable
Flammability (solid/gas):	Not applicable
Autoflammability:	Not applicable
Explosive properties:	Incorporates explosive charges - decomposition/ignition temperature above 74°C
Oxidising properties:	Not applicable
Vapour pressure:	Not applicable
Relative density:	Not applicable
Solubility - water solubility:	Not applicable
Vapour density:	Not applicable
Miscibility:	Not applicable
Evaporation rate:	Not applicable
Conductivity:	Not applicable
Viscosity:	Not applicable
Explosion limits:	Not applicable

**10. STABILITY AND REACTIVITY****Stability:**

Detonation can occur from impact, friction, excessive heating or by intense electrical energy from an extraneous source (eg. lightning).

**Conditions to Avoid:**

Temperature:	Heating to >74°C may lead to decomposition of explosive charges and detonation. Avoid prolonged storage at temperatures in excess of 50°C. Store in cool and dry conditions.
Pressure:	No
Light:	Not applicable
Impact:	Excessive impact can lead to damage and possible detonation
Friction:	Friction can lead to possible damage and detonation
Ignition:	Exposure to ignition / heat sources can lead to detonation

**Material to Avoid:**

Water:	Yes
Air:	No
Acids:	Only in extreme conditions. Can react with metallic shell and lead wires causing possible erosion and reaction
Bases/Alkalis:	As with acids
Oxidisers:	Only in extreme conditions / prolonged contact - possible erosion of shell and lead wires
Reducing Agents:	Not applicable
Specific Substances:	None
<b>Decomposition:</b>	Only under extreme conditions outlined above

**11. TOXICOLOGICAL INFORMATION**

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product information since the explosive chemical constituents are sealed within the detonator shell.

**Dangerous to Health:**

Inhalation:	Test firing of detonators in poorly confined areas can cause presence of lead fume which can be irritant to mucous membranes and respiratory tract
Ingestion:	Lead Azide - 0.15 mg/m <sup>3</sup> (8hrTWA) Lead Styphnate
Dermal:	Low
Eye contact:	May result in physical injury
Skin contact:	Not expected to be a skin irritant.
Sensitiser:	No
Carcinogenic:	No
Mutagenic:	No
Narcotic:	No
Teratogenic:	No
Toxic:	No

**Long term effects:**

Long term exposure to low concentrations of lead may result in altered haemoglobin breakdown, anaemia and central and peripheral nervous system damage.

**Acute toxicity / Chronic toxicity:**

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

**12. ECOLOGICAL INFORMATION**

No experimental toxicological data of the product is available. Remains from fired detonators will contain small traces of heavy metals, aluminium, zinc, copper and lead (from the detonator shell and internal components). Contamination of soil and groundwater should be avoided.

**13. DISPOSAL CONDITIONS****Disposal for:**

Article:	Detonation under controlled conditions - seek expert advice
Preparation:	Not applicable
Contaminated packaging:	Disposal at site by controlled burning
Incineration:	No. Incineration only of remains of fired detonators prior to disposal as metallic waste by approved contractor
Recycling:	No
Landfill:	No

Disposal and return of product should only be carried out under the direct supervision of a person knowledgeable about explosives products and in accordance with the requirements of the Health and Safety at Work Act 1974, the Control of Pollution Act 1974 and The Environmental Protection Act 1990.

For small quantities of detonators, typically a few only, these can be inserted into a primer cartridge and detonated along with the primer cartridge. All surplus packaging should be disposed of by controlled burning in a remote location, after examining all packaging materials for any explosive remnants.

Disposal of large quantities of detonators should be undertaken only in consultation with the manufacturer and under direct supervision of the manufacturer's technical personnel.

Disposal of detonators by burning should never be considered as an alternative to detonation since uncontrolled detonations will occur.

**14. TRANSPORT, PACKAGING AND LABELLING**

**UN Name:** DETONATORS, ELECTRIC, for blasting  
**UN Number:** 0030  
**IMDG (sea) Code/Class:** Class 1.1 B  
**Pck/Grp:** II  
**IMDG Code Page No.:** Page 1257  
**RID/ADR (road/rail) Class:** Class 1.1 B

In addition, attention should be paid to additional information as set out in the Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations 1994 or in international agreements on the transport and packaging of dangerous goods.

**15. REGULATORY INFORMATION**

**EEC Classification:** EE12  
**Danger Symbol:** As per SI 1140 1983  
**Risk Phrases:** See Section 2  
**Safety Advice:** See Section 2

In addition, reference should be made to any legislative or regulatory requirements which may be imposed by Regulation 9 of CHIP 2 and/or other relevant measures such as the Health & Safety at Work Act 1974 (HSWA) and the Control of Substances Hazardous to Health Regulations 2002 (COSHH) etc.

**16. OTHER INFORMATION**

**Training Advice:** Seek advice on handling and use from the manufacturer.  
**Recommended use:** Detonators are used for the initiation of high explosives. Refer to the relevant product Technical Data Sheet for further details. The product is not suitable for use in underground coal mines or methane/gassy atmospheres.  
**Restrictions in Use:** Restricted by regulatory authority approvals.

This Material Safety Data Sheet (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 the manufacturer cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, review the 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 the manufacturer.

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.