



Material Safety Data Sheet

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SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Supplier(s):

Orica Canada Inc.
Maple Street
Brownsburg, QC
For MSDS Requests: 450-533-4201

Orica USA Inc.
33101 E. Quincy Avenue
Watkins, CO 80137-9406
For MSDS Requests: 1-303-268-5000

Product Name: Exel Connectadet (Detonator Assemblies Non Electric)
Product Code: 20063
Alternate Name(s): Not available
UN-No: UN0500
Recommended Use: Non-Electric detonators and accessory products.

Emergency Telephone Number: FOR CHEMICAL EMERGENCIES (24 HOUR) INVOLVING TRANSPORTATION, SPILL, LEAK, RELEASE, FIRE OR ACCIDENTS: IN CANADA AND US CALL THE ORICA TRANSPORTATION EMERGENCY RESPONSE SYSTEM AT **1-877-561-3636**. IN THE U.S. FOR LOST, STOLEN OR MISPLACED EXPLOSIVES CALL: BATF **1-800-800-3855**. FORM ATF F 5400.0 MUST BE COMPLETED AND LOCAL AUTHORITIES (STATE/MUNICIPAL POLICE, ETC.) MUST BE ADVISED.

SECTION 2 - HAZARD IDENTIFICATION

Emergency Overview:

The following information is the potential hazards associated with the ingredient(s) in this product. It is our belief that, under conditions of normal occupational exposure, this product should pose no such hazards to the user. Main risk is that of explosion by shock, friction, fire or other sources of ignition. Read the entire MSDS for a more thorough evaluation of the hazards.

Appearance: A signal line (solid core/ shock/tube) containing an explosive charge and a detonator.	Physical State: Solid	Odor: Odorless
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SECTION 3 - COMPOSITION/ INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %
Pentaerythritol Tetranitrate (PETN)	78-11-5	0 - 10
Lead Azide	13424-46-9	0 - 5
Cyclotetramethylenetetranitramine (HMX)	2691-41-0	0.2-0.4
Aluminum	7429-90-5	<0.1

Also-may contain a lead sheathed delay element(s); may include a delay composition.

SECTION 4 - FIRST AID MEASURES

General advice: General: Not applicable; this is a packaged product that will not result in exposure to the contents under normal conditions of use.
In the event of contact, administer first aid appropriate for burns, lacerations and bruises. If detonation fumes are inhaled, remove to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation, but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.

Eye contact: No applicable information.
Skin contact: No applicable information.

SECTION 4 - FIRST AID MEASURES

Inhalation: In the event those workers are overexposed to fumes and vapors resulting from detonation, remove victim from exposure and provide artificial respiration if not breathing.

Ingestion: No applicable information.

Notes to physician: No applicable information.

SECTION 5 - FIRE-FIGHTING MEASURES

Flammable properties: High explosive with mass detonation hazard. Expected to be sensitive to mechanical impact. Not expected to be sensitive to static discharge.
DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Evacuate surrounding areas. When controlling fire before involvement of explosives, fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear. Water may be applied through fixed extinguishing system (sprinklers) as long as people need not be present for the system to operate. Water may be used on small fires.

Suitable extinguishing media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVES.

Unsuitable extinguishing media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Immediately evacuate all personnel from the area to a safe distance. Guard against re-entry. This product is a high explosive with a mass detonation hazard. Thermal decomposition can lead to release of irritating gases and vapors.

Protective equipment and precautions for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH approved (or equivalent) and full protective gear

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Methods for containment: No information available.

Methods for cleaning up: Not required. If detonators are damaged, contact an Orica Canada Inc. or Orica USA Inc. technical representative. Deactivating Chemicals: Not required. If detonators are broken, contact product advisor.

SECTION 7 - HANDLING AND STORAGE

Handling: This product is an explosive and should only be used under the supervision of trained personnel. Protect containers from physical damage. Keep away from incompatible materials, heat, sparks, flames and other ignition sources. Avoid rough handling.

Storage: Store under moderate temperatures recommended by a technical services representative. Store under dry conditions in a well ventilated magazine that has been approved for either detonator storage or explosive storage. Do NOT store explosives in a detonator magazine or detonators in an explosive magazine. Keep away from heat, sparks and flames. Keep containers closed. Explosives should be kept well away from initiating explosives; protected from physical damage; separated from oxidizing materials, combustibles, and sources of heat. Keep away from incompatibles. Meet all legal requirements for shipping and magazing. **Storage Temperature:** It is recommended that detonators not be stored or used at temperatures exceeding 70 °C (158 °F) without approved procedures to address the elevated temperatures.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Nitrogen Dioxide	3 ppm	1 ppm	
Carbon Monoxide	25 ppm	35 ppm	
Sulphur Dioxide	2 ppm		
Lead Azide	0.05 mg/ m3	0.05 mg/ m3	

Other exposure guidelines: Recommendations listed in this section indicate the type of equipment that will provide protection against exposure to this product under normal conditions of use. Conditions of use, adequacy of engineering or other control measures, and actual exposure situations will dictate the need for specific protective devices at your workplace.

Engineering Measures: Full-handling precautions should be taken at all times.

Personal Protective Equipment

Eye/face protection: Safety glasses with side-shields are recommended to prevent eye contact.

Skin protection: Gloves and protective clothing made from cotton should provide adequate protective.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practice

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	A signal line (solid core/ shock/tube) containing an explosive charge and a detonator.	Odor:	Odorless
Physical State:	Solid	Viscosity	No information available
pH:	No data available	Melting Point/Range:	PETN melts at 140°C / 284 °F
Flammable Limits (Upper):	No data available	Flammable Limits (Lower):	No data available
Explosion Power:	No data available	Specific Gravity:	Not available
Vapor Pressure:	Not available	Oxidizing Properties:	No information available
Partition Coefficient (n-octanol/water):	No data available		

SECTION 10 - STABILITY AND REACTIVITY

Stability:	Unstable. Can explode from impact, heat or friction. If detonators are broken, contact product advisor. PETN explodes at 190 - 210°C (374 - 410°F).
Conditions to avoid:	Impact or shock. Static discharge.
Incompatible materials:	Acids, Bases.
Hazardous decomposition products:	Thermal decomposition products are toxic and may include lead, hydrocarbons, oxides of carbon and nitrogen. To a lesser degree, decomposition products may include oxides of lead, chromium, barium, boron and hydrogen cyanide.

SECTION 11 - TOXICOLOGICAL INFORMATION

Acute Toxicity

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Pentaerythritol Tetranitrate	1660 mg/kg Rat		
Lead Azide	790 mg/kg Rat		

Subchronic Toxicity (28 days): Organic nitrates act as vasodilators; signs and symptoms of poisoning include headache, dizziness, increased heart rate, postural weakness and hypotension. Dermatitis or "drug rash" of the skin may also be observed.

Chronic toxicity: Contains no substance that is a known carcinogen.
Carcinogenicity: The ingredients of this product are not classified as carcinogenic by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as carcinogens by OSHA (occupational Safety and health Administration), and not listed as carcinogens by NTP (National Toxicology Program).

Reproductive effects: It is our belief that under normal conditions of use, this product should pose no reproductive hazard to the worker. Lead exposure may cause reproductive effects based on studies in laboratory animals and on human epidemiological studies.

Developmental effects: It is our belief that under normal conditions of use, this product should pose no reproductive hazard to the worker. Lead has been shown to cause congenital abnormalities and behavioural deficits in experimental animals in addition to its ability to increase the number of miscarriages, stillbirths and abortions in lead-exposed women.

Target Organ: Eyes, Skin, cardiovascular system, Immune system.

Other adverse effects Prolonged or repeated exposure to organic nitrates may develop a tolerance due to chronic dilation of the blood vessels. This tolerance disappears rapidly after a few days away from exposure and withdrawal symptoms consisting of angina and heart attack have been reported in chronically exposed workers. Another type of tolerance loss is the "Monday morning disease", where workers experience headaches, dizziness, postural weakness and other symptoms.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity effects: Contains no substances known to be hazardous to the environment or not degradable in wastewater treatment plants.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Method: Burn under supervision of an expert at a government-approved explosive burning ground or destroy, by detonation in boreholes, in accordance with applicable local, provincial and federal laws. Call upon the services of an Orica Canada Inc. or Orica USA Inc. technical representative.

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Pentaerythritol Tetranitrate	(hazardous constituent - no waste number)			

SECTION 14 - TRANSPORT INFORMATION

DOT Proper Shipping Name: Detonator assemblies, Non-Electric
Hazard Class: 1.4B or 1.4S (depending on packaging)
UN-No: UN0500
Packing group: II
TDG Proper Shipping Name: Detonator assemblies, Non-Electric
Hazard Class/Division: 1.4B or 1.4S (depending on packaging)
UN-No: UN0500
Packing group: II

Transportation Emergency Telephone Number: 1-877-561-3636

SECTION 15 - REGULATORY INFORMATION

CANADIAN CLASSIFICATION: This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS contains all the information required by the CPR

WHMIS hazard class: This product is an explosive and is not regulated by WHMIS.

USA CLASSIFICATION:

SARA Regulations Sections 313 and 40 CFR 372: This product contains the following toxic chemical(s) subject to reporting requirements,

SARA 311/312 Hazardous Categorization

Acute Health Hazard: No
Chronic Health Hazard: No
Fire Hazard: No
Reactive Hazard: Yes
Sudden Release of Pressure Hazard: No

Ozone Protection and 40 CFR 42: No reportable quantities of ozone depleting agents

Other Regulations/Legislations which apply to this product: Massachusetts Right-to-Know, Pennsylvania Right-to-Know, New Jersey Right-to-Know, Rhode Island Right-to-Know.

SECTION 15 - REGULATORY INFORMATION

TSCA: Complies

DSL: Complies

NDSL: Complies

The components in the product are on the following International Inventory lists:

Chemical Name	TSCA:	DSI:	NDSI:	ENCS	EINECS	ELINCS	CHINA	KECI	PICCS	AICS
Pentaerythritol tetranitrate	X	X		X	X			X		X
Lead Azide	X	X		X	X			X		X

Legend: X - Listed

SECTION 16 - OTHER INFORMATION

Prepared By: Safety, Health & Environment
303-268-5000

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The information contained herein is offered as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Orica will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein.

End of MSDS