



**Ministry of Transportation and Infrastructure
Avalanche and Weather Programs**

EXPLOSIVE SPILL ON HIGHWAY

**EMERGENCY
RESPONSE
ASSISTANCE PLAN
2-0804**



Emergency Spill on Highway

Section I

Emergency Response

This section fulfills requirements of the Transportation of Dangerous Goods Act and Regulations. It deals specifically with the treatment to be taken in the event of an incident during the transportation of explosive products to be utilized by the Ministry, Avalanche and Weather Programs.

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REASONABLE EMERGENCY MEASURES

Should Ministry or maintenance contractor personnel encounter or be informed of a Ministry Avalanche and Weather Programs explosives spill on a highway, the following measures should be taken:

1. Close and sweep the affected section of highway. Set up road closure barriers to a distance no closer than 1600 metres from the incident site. Road closure locations must have responsible personnel (with MOTI radio frequency) to ensure only authorized personnel or vehicles are allowed access into the hazard area.
2. Contact the Transportation Management Centre as the ERAP telephone number: (1-866-707-7862) and identify the location of the incident. Request the Transportation Management Centre to initiate the Emergency Response Plan 2-0804 for Explosive Spill by Ministry, Provide information necessary to fill out the **ERAP Incident Report**.
3. If the vehicle transporting the explosive products was in a motor vehicle incident, ensure that occupants of the vehicle have been removed (providing no personal danger) from the hazard area and that first aid has been applied as required.
4. If there is a fire separate from the explosive cargo, attempt to extinguish it. If fire is affecting the explosive cargo, evacuate all personnel (including any dwellings) to 1600 meters. Do not fight a fire affecting the explosive cargo.
5. Ensure the security of the hazard area until the ERAP Holder, MOTI Senior Avalanche Officer assesses treatment of the spill and containment to respond accordingly.

AUTHORIZED PERSONNEL

Once the hazard area is secured, the only authorized personnel who may be allowed access into the incident site area are:

- Technical Advisor
- Incident Commander
- Task Force
- Ambulance Attendants
- RCMP
- Technical Specialists for Explosives Disposal

All other personnel must stay at or beyond the 1600 metre barricades unless collective authorization is provided by the above personnel.

ERAP INCIDENT REPORT

Reported by (name): _____ Phone # _____

Contact info: _____

ERAP reference number: 2-0804

Spill date: _____ Spill time: _____

Exact location of spill: _____

Mode of Transportation: _____ Shipping name of Dangerous Goods,
or UN: _____

Quantity of explosives before spill: _____

Quantity of explosives spilled: _____

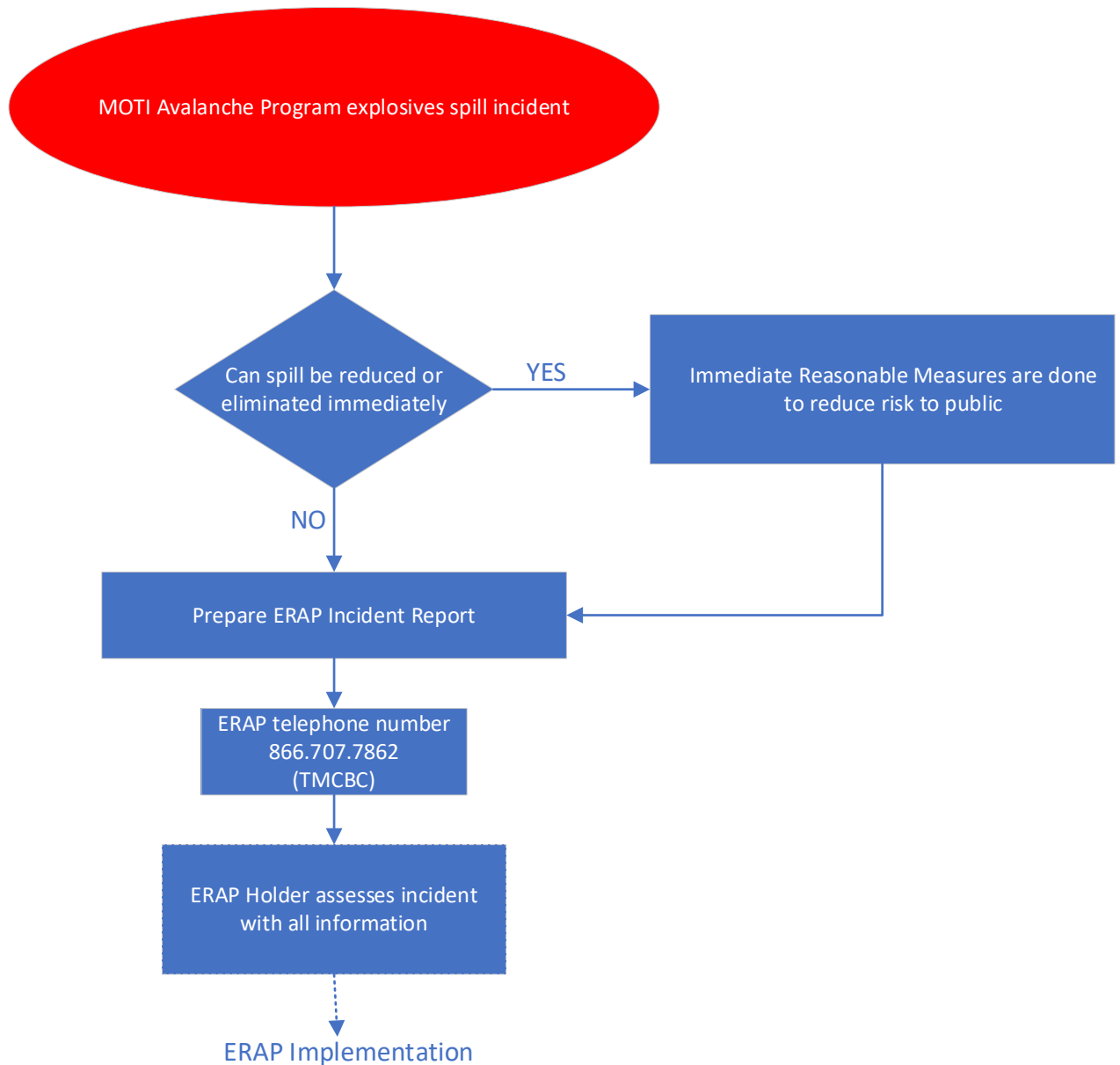
Description of containment: _____

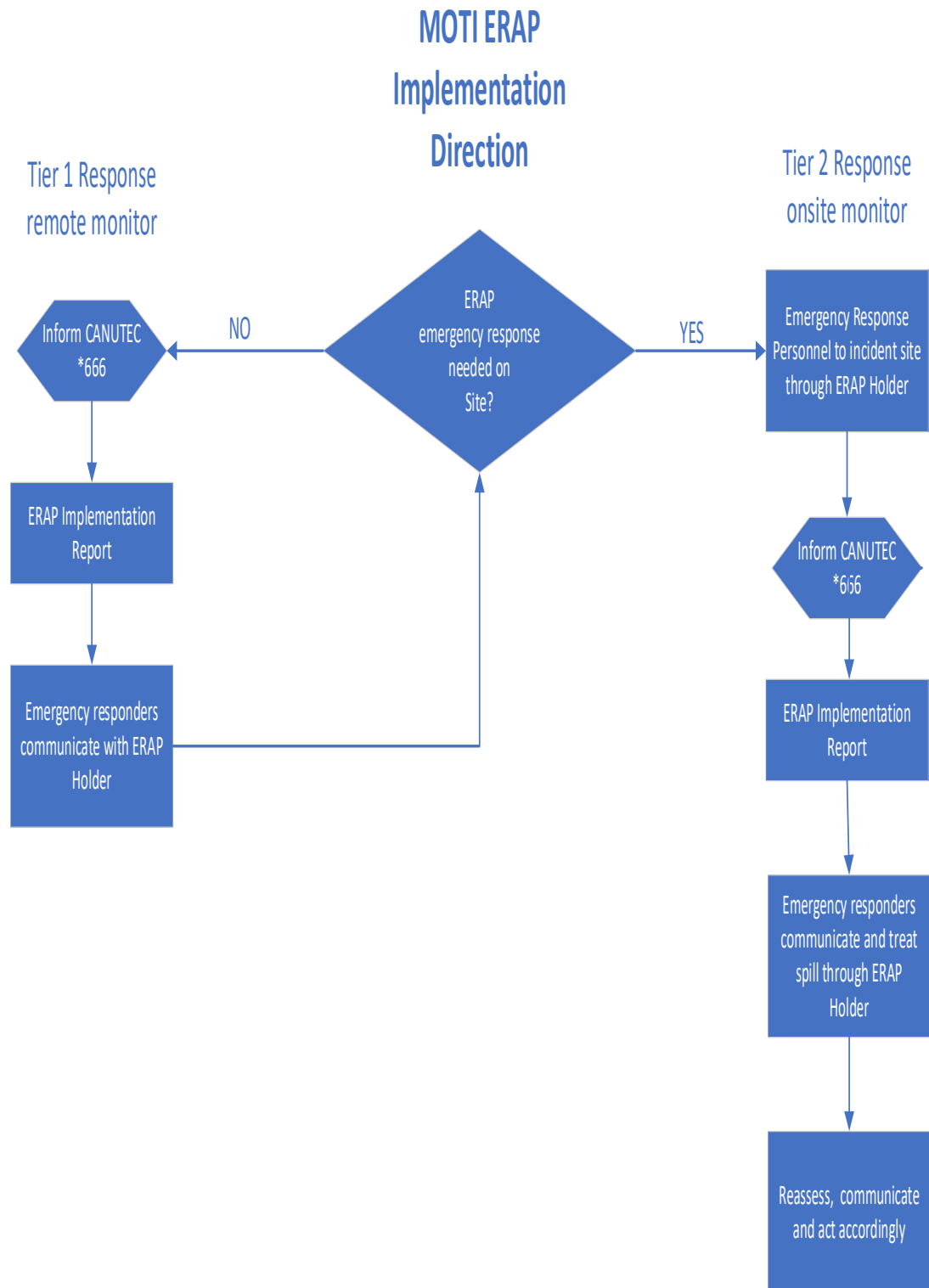
Containment integrity compromised. ____ Describe: _____

Transfer of Dangerous Goods to other containment? _____

Type of incident leading to spill: (i.e.; vehicle roll over, collision, load shift):

MOTI AWP ERAP Incident Reporting





ERAP Incident Implementation Advice

Should the ERAP telephone number be alerted, (Transportation Management Centre: 866.707.7862) indicating a Ministry, Avalanche and Weather Program related explosive spill on a highway, the ERAP 2-0804 will be implemented by ERAP Holder, MOTI Senior Avalanche Officer (250.551.0690).

Tier 1 Incident Implementation

ERAP Holder – Senior Avalanche Officer:

Assess incident site with remote monitoring and risk communication to the Response Leader (Incident Commander), Task Force Team Leader and Technical Advisor with necessary communications to treat containment of spill incident safely and efficiently.

▪ ***Risk Communications from the ‘ERAP Holder’, MOTI Senior Avalanche Officer to:***

1. The Response Leader (Incident Commander)

- District Manager of Transportation, or
- Acting District Manager of Transportation or designate

2. Task Force Team Leader - In order, contact one of the following:

- Maintenance Contractor Road Supervisor
- MOTI Area Manager

3. The Technical Advisor - In order, contact one of the following:

- Avalanche Technician Supervisor
- Avalanche Technician or Assistant
- Manager, Avalanche and Weather Programs
- Senior Avalanche Officer

4. The Local RCMP Detachment

5. The Manager, Avalanche and Weather Programs

6. Contact CANUTEC

Tier 2 Incident Implementation

ERAP Holder – Senior Avalanche Officer

Assess incident site with onsite monitoring and risk communications to emergency response resources team with necessary measures to treat containment of spill incident safely and efficiently

Response Leader (Incident Commander)

The District Manager of Transportation or designate will perform duties as the **Response Leader (Incident Commander)**:

- Instructs any available personnel with a radio at the incident site to block traffic at a distance of at least 1600 metres from the explosive spill area, and to evacuate any unauthorized vehicles/personnel between blockades
- Contacts and relays ERAP Incident Report details to:
 - 1. Ministry Area Manager** (responsible for the affected section of highway)
 - 2. Local Maintenance Contractor Road Supervisor.**
- Contacts and relays relevant ERAP Incident Report to the following agencies/personnel in the following order:
 - 1.** The nearest ambulance service ***if*** needed
 - 2.** The nearest fire department ***if*** needed
 - 3.** RCMP Explosives Disposal Unit; 778.290.6004 (24 hours #)
 - 4.** Emergency Management BC (EMBC) 1-800-663-3456 (24hr.#)
 - 5.** CANUTEC (888) 226-8832 (24 hours #) or (613) 996-6666 or cell; *666

Reassessment Measures

- Reassesses road closure status and locations based on recommendations of the ERAP Holder, Task Force Team Leader or Technical Advisor.
- Oversees and coordinates the spill from the time of initial involvement to its final completion.
- Liaises closely with the, ERAP Holder, Task Force Team Leader, Technical Advisor, EMBC and Transportation Management Centre to stay informed about developments at the incident site and to exchange any necessary information.

Tier 2 Incident Implementation continued

- Controls radio communications; ensures only essential and necessary utilization of the radio.
- Acts as or designates an official Ministry Spokesperson to respond to any questions from the media.

Task Force Team Leader

The Ministry Area Manager or the Maintenance Contractor Road Supervisor will perform duties ***Task Force Team Leader***:

- Travels to the incident site without delay. En route establishes contact with the ***Technical Advisor*** (local Avalanche Technician) and the ***Response Leader (Incident Commader)***
- Is responsible for the safety of all personnel at the incident site and to effectively coordinate activities at the incident site
- Makes assessment of the incident site and determines appropriate evacuation distance subject to recommendations from the ***Technical Advisor***. The assessment should include information taken from placards on carrier vehicle involved in the spill and/or shipping documents, if safe to do so
- Ensures that Traffic Control Personnel are radio equipped in appropriate road closure locations to prevent unauthorized vehicles from entering the hazard area
- Ensures that a sweep has been done to clear any unauthorized personnel or vehicles from the hazard area

Reassessment Action

- If necessary, makes recommendations to fire fighting crews after consultation with ***Technical Advisor*** regarding firefighting options.
- Ensures that spilled explosive material is handled ONLY at the discretion of and under the direct supervision of the ***Technical Advisor***.
- Arranges for transportation of explosive cargo from the incident site in an alternate vehicle if necessary.
- Supervises clean-up of the incident site following recommendations from the ***Technical Advisor***.

Tier 2 Incident Implementation continued

- Supervises re-opening the road

Technical Advisor

The Avalanche Technician or designate will perform duties as the ***Technical Advisor***:

- Contact with the **Response Leader (*Incident Commander*)**.
- Assesses explosive type(s), quantity and conditions at the incident site to determine minimum evacuation distance. This information may be acquired from the **ERAP Incident Report page**
- Arranges for the delivery of explosives clean up materials and equipment as necessary for the severity and extent of spilled explosives. Contacts other explosive technical advisors as necessary
- Confirms with **Task Force Team Leader** that assistance (as necessary) from outside agencies has been made (EMBC, RCMP, CANUTEC, DND)
- Advises the **Response Leader (*Incident Commander*)** of the most appropriate actions to ensure safety of all personnel involved
- Confirms with Transportation Management Centre, **Response Leader (IC)**, key Ministry personnel, Maintenance Contractor personnel and outside agencies have been notified and dispatched to the incident site as necessary
- Liaises closely with the **Response Leader (*Incident Commander*)** (and outside agencies at the incident site, i.e., RCMP, EMBC) to ensure that all decisions made reflect the utmost concern for safety of involved personnel

Reassessment Measures

- Determines the most appropriate method for clean-up of spilled explosive products
- Determines feasibility of transferring spilled explosive products from the incident site in an alternate vehicle to an appropriate location
- Ensures that essential personnel only are involved in the transfer and clean-up of spilled explosive products to minimize risk
- Ensures that the area has been thoroughly searched to confirm that all spilled explosive materials have been removed prior to re-opening the highway

ERAP Incident Implementation Report

Reported by (name): _____ Phone # _____

Contact info: _____

ERAP reference number: 2-0804

Person Authorized to use ERAP 2-0804: _____

ERAP Implementation Level Action: **Tier 1** _____ **OR** **Tier 2** _____

Date and Time of ERAP Implementation: _____

Shipping name or UN # of Dangerous Goods: _____

Response measures taken to contain spill: _____

Emergency Spill on Highway

Section II

Resources

This section fulfills requirements of the Transportation of Dangerous Goods Act and Regulations. It deals specifically with resources needed for the implementation of this plan.

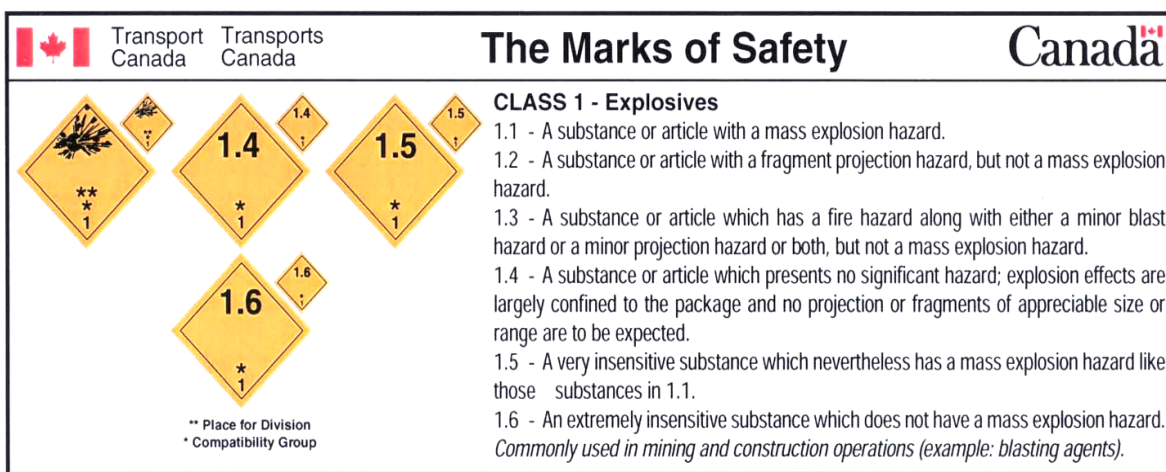
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Identification of Explosives Cargo


There are three ways to identify the types of explosives involved in a spill:

1. **Placards:** From a distance, read information on placards attached to the vehicle. There are four placards, one at each end and on both sides of the vehicle. Placards used for explosives transported by MoTI meet federal regulations and are triangular, with black lettering against an orange background. MoTI most commonly uses: **1.1D**, **1.1B** and **1.5D**.



NB: It is legal to have mixed loads, i.e. 1.1D, 1.5D and 1.1B can be transported together under certain conditions. The 1.1B materials (fuse assemblies, detonators) will be separated from the other explosives by a minimum of six inches of wood. Only one placard is used for a mixed load. Thus, a cargo with a placard showing 1.1D may also contain 1.5D and/or 1.1B type explosives. Shipping documents will give more precise information as to the type and quantity of explosives.

2. **Shipping Documents:** The driver, if unharmed, will have these. Or if it is safe to approach the vehicle, a copy of the shipping document(s) will be displayed in a conspicuous place in the cab. A sample of the shipping document used by MoTI and a detailed description of the types of explosives transported by MoTI can be found on the next two pages.
3. **Explosive Containers:** Information is printed on the outside of containers, including class, shipping name and/or synonym. Again, only approach if the scene is safe. Containers used for explosives are either heavy cardboard boxes (1.1D), heavy plastic bags (1.5D), or smaller foil or plastic bags (1.1B). The latter may be inside a carton container, appropriately marked, or they may be in a special wooden container designed to meet the six-inch wooden barrier requirement.

	BRITISH COLUMBIA Ministry of Transportation and Infrastructure	DANGEROUS GOODS SHIPMENT				
SHIPPING DOCUMENT						
Date: _____		Point of Origin: _____				
CONSIGNOR <i>(Shipper)</i>		CONSIGNEE <i>(Destination)</i>				
Name: _____		Name: _____				
Address: _____ _____ _____		Address: _____ _____ _____				
Transport Unit # _____		Name of Carrier: _____				
Vehicle License # _____						
REGULATED DANGEROUS GOODS						
24 HOUR NUMBER CANUTEC: (613) 996-6666 CELL: *666				ERAP REFERENCE #: 2-0804 ERAP telephone #: (866) 707-7862		
UN Number	Shipping Name (If applicable, Technical Name)	Primary Class	Packing Group	Total Quantity (kg, L, NEQ)	Number of packages requiring labels	# of Units
UN0042	BOOSTERS without detonator	1.1D	II			
UN0360	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.1B	II			
UN0361	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.4B	II			
UN0331	EXPLOSIVE, BLASTING, TYPE B	1.5D	II			
UN0065	CORD, DETONATING, Flexible	1.1D	II			
UN0131	LIGHTERS, FUSE	1.4S	II			
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the Transportation of Dangerous Goods Regulations.						
Shipper's Name <i>(print)</i> _____				Signature: _____		
<small>Distribution: Original White – Shipper/Consignor Yellow Copy – Carrier Pink Copy – Receiver/Consignee Goldenrod Copy – Stockperson/Inventory H0550 (2017/02/23)</small>						

MOTI AWP TDG shipping information form sample

TDG Shipping Information

Description	Proper Shipping Name	Classification	UN Number
Cast Boosters, various sizes	Boosters , <i>without detonator</i>	1.1D	0042
Safety fuse assemblies	Detonator assemblies, non-electric , <i>for blasting</i>	1.1B	0360
Safety fuse assemblies	Detonator assemblies, non-electric , <i>for blasting</i>	1.4B	0361
AN/FO	Explosives, Blasting, Type B	1.5D	0331
Detonating Cord	Cord, Detonating , <i>flexible</i>	1.1D	0065
Emulsion/ANFO blend HEET or Hydromite	Explosives, Blasting, Type E	1.5D	0332

The table above provides information required in shipping documents for products transported under this ERAP. **Bolded** portion of the “**Proper Shipping Name**” is the only acceptable shipping name and **MUST** appear on the shipping documents. *Italicized* words are optional. All these products are **packing group II**.

Placards that correspond to the most hazardous portion of your load must be used regardless of quantity.

Remember to calculate the NEQ (net explosive quantity) for your load and to update your documentation as the load is depleted if you are **NOT** in control of the blasting logbook.

Check the compatibility chart for your load.

Special handling / Emergency Instructions

ERAP Phone 866.707.7862 (24-hour number). Use ERAP 2 – 0804.

Explosives Hazard Information

INSTRUCTIONS TO DRIVERS

High explosives - Class 1.1 and 1.5 - these classes cover most of the explosives used by MoTI Avalanche and Weather Programs.

1.1D - Cap Sensitive Explosives, (Cast primers such as SnoDet, Orange Cap Booster, Primacord, etc.)

Packaging: Heavy cardboard boxes.

Hazards:

1. Explosion
2. Toxic Fumes
3. Possible Water Contamination

1. Easily the most important concern. The possibility of a major detonation. This could be triggered by heat, impact, or lightning.
2. Burning explosives give off toxic fumes. The area should be evacuated before this is a problem.
3. Usually water contamination a very minor problem with class 1.1D.

Initial Action:

1. Shut off ignition. Eliminate all sources of fire. Control any spillage or oil.
No Smoking.
2. Extinguish any small engine, tire, etc. fires. **ONLY IF DEEMED SAFE TO DO SO.**
3. Keep all unauthorized personnel away from the area. If fire is involved, clear area for a minimum of 1600 meters.
4. Call TMCBC (ERAP telephone; 866.707.78620) for ERAP Holder to help in handling explosives.

Explosives Hazard Information

INSTRUCTIONS TO DRIVERS

1.5D - Stick Sensitive; Cap Insensitive - (AN/FO)

Packaging: Bulk or plastic bags.

Hazards: 1. Fire and potential explosion
 2. Toxic Fumes
 3. Water Pollution

1. Ammonium nitrate (AN) is an oxidizing agent; hence, will supply oxygen (O₂) to support combustion of fuels. It can explode violently if overheated in a confined space, particularly if mixed with organic materials such as fuel oils, i.e. AN/FO.
2. Will emit toxic fumes (yellow, red, or brown) of nitrogen oxides (NO_x).
3. Ammonium nitrate is toxic to aquatic life in concentrations as low as 10-100 parts per million. AN can melt at 170 degrees C and therefore begin to flow.

Initial Action:

1. Keep all unauthorized personnel away from the area.
2. Shut off ignition. Eliminate all sources of fire. **NO SMOKING!**
3. Control all fuel and oil spillage.
4. Extinguish any small engine, tire, etc. fires (ONLY IF DEEMED SAFE TO DO SO).
5. If there is fire and it is deemed safe; extinguish with copious amounts of water. Remember AN is water soluble so strict attention should be paid to run off to avoid contamination of streams. AN is an oxidizer; thus, it is useless to attempt to smother the fire. Attempts to ventilate - open the powder box or container should be undertaken only if deemed safe to avoid an "overheated state in a confined space" which may lead to detonation. Self-contained breathing apparatus should be used.
6. If anyone becomes exposed to fumes from the fire (NO_x) fumes. Avoid exertion.
7. If the fire is uncontrollable or deemed unsafe to combat, evacuate the area for 1600 meters.
8. If there is no fire, contain or control any leakage or run off by digging a pit or corralling with dirt. Cover spills with plastic to avoid dissolving by rainwater.
9. Call TMCBC (ERAP telephone 866.707.78620) for ERAP Holder to help in handling explosives.

Explosives Hazard Information

INSTRUCTIONS TO DRIVERS

1.1B - E.B. Caps, Safety Fuse Assemblies

Packaging: Cardboard boxes, plastic bags.

Hazards: 1. Potential explosion with shrapnel.

1. Although blasting caps are carried in small quantities in separate and confined areas, they are capable of explosion from heat, concussion, abrasion, and lightning.
2. When detonated, the danger of flying metal fragments is very likely.

Initial Action:

1. Keep all unauthorized personnel away from the area.
2. Shut off the engine and eliminate all sources of fire. NO SMOKING.
3. Control all fuel and oil leaks or spillage.
4. Extinguish any fires only if deemed safe to do so.
5. If there is uncontrollable fire evacuate the area for 800 meters of this and other types present.
6. Call TMCBC (ERAP telephone 866.707.7862) for ERAP Holder to help in handling explosives.

2000 Emergency Response Handbook Guidelines

EMERGENCY ACTIONS EXPLOSIVES DIVISION 1.1, 1.2, 1.3, 1.5

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- MAY EXPLODE AND THROW FRAGMENTS 1600 METERS (1 MILE) OR MORE IF FIRE REACHES CARGO

HEALTH

- Fire may produce irritating, corrosive and / toxic gases.

PUBLIC SAFETY

- Isolate spill or leak area immediately for at least 500 meters (1/3 mile) in all directions
- Move people out of line of sight of the scene and away from windows
- Keep unauthorized personnel away
- Stay upwind
- Ventilate closed spaces before entering

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus
- Structural firefighters' protective clothing will only provide limited protection

EVACUATION

Large Spill

- Consider initial evacuation for 800 meters (1/2 mile) in all directions

Fire

- If rail car or trailer is involved in a fire and heavily encased explosives such as bombs or artillery projectiles are suspected, ISOLATE for 1600 m (1 mile) in all directions; also initiate evacuation including emergency responders for 1600 m (1 mile) in all directions.
- When heavily encased explosives are not involved, evacuate the area for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE

CARGO FIRES

- DO NOT fight fire when fire reaches cargo! Cargo may explode!
- Stop all traffic and clear the area for at least 1600 meters in all directions and let burn.
- Do not move cargo or vehicle if cargo has been exposed to heat.

TIRE OR VEHICLE FIRES

- Use lots of water - FLOOD it! If water not available, use CO2, dry chemical, or dirt.
- If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- Pay special attention to tire fires as re-ignition may occur. Stand by with extinguisher ready.

ERAP - EMERGENCY CALL OUT LIST

Should additional technical information be required contact:

MOTI Avalanche and Weather Programs ERAP Holder

1 (250) 551-0690

DYNONOBEL

1 (250) 837-1216

CIL

1 (250) 423-3302

RCMP - EXPLOSIVE DISPOSAL UNIT

(778) 290-6004 (24-hour emergency contact)
ask for on call member of the Explosive Disposal Unit (EDU) team

DND Emergency Ordinance Disposal (for military explosives)

BC Domestic Operations Detachment
CFB Esquimalt

1 (250) 360-8720

Emergency Management British Columbia

1-800-663-3456 (24-hour emergency contact)

CANUTEC

(613) 996-6666 (24-hour emergency contact)

(888) 226-8832 (24-hour emergency contact)

Cell; *666 (24-hour emergency contact)

ERAP Incident Spill Equipment

Mechanical Equipment

- Numerous 4x4, 3/4-ton pick-up trucks with rubber lined covered boxes and placards
- Full variety of earth and snow removal equipment (loaders, graders, bulldozers, dump trucks, plow trucks, etc.) available through Maintenance Contractors
- Remote lighting equipment for night work

Fire Fighting Equipment

- Shovels
- Fire extinguisher(s)
- Water: Will need fire department truck to respond.

Response Equipment Caches for Weather Protection and Recovery

- High visibility vests
- Non sparking head lamps and flashlights
- Clear plastic package repair tape
- Heavy duty tape (Duct tape)
- Tarps - plastic sheets to protect spilled ANFO from precipitation
- Gloves (cotton and rubber)
- Plastic buckets (with lids) for containing spilled ANFO
- Non sparking shovels - scoops for cleaning up ANFO
- Hazard zone tape for marking exclusion zones
- Pad of TDG shipping documents

Response equipment caches are located with avalanche rescue caches adjacent to routes used for transportation of explosives. These caches are maintained by the local maintenance contractor and inventoried by the MOTI Avalanche Technician in that area. The cache can be transported to the incident site by either the Maintenance Contractor or the Technical Advisor.

Emergency Spill on Highway

Section III

Training and Preparation

This section deals specifically with elements of training and preparedness required to implement this plan with safety and efficiency.

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MoTI Avalanche Areas with Explosives Transportation

The Ministry of Transportation, Avalanche and Weather Programs uses a variety of explosive products while stabilizing avalanche slopes which may threaten public highways. These products are transported to and stored in licensed magazines adjacent to specific areas with an active avalanche control program.

Avalanche Area	Service Area	Highway
Bear Pass	25 – Bulkley Nass	Hwy 37A
Ningunsaw Pass	28 - Stikine	Hwy 37
Terrace-Tyee	26 – Skeena	Hwy 16
Doris Lake	25- Bulkley Nass	Chapman Rd
Moose Pasture	28- Stikine	Hwy 37
Cassiar	28- Stikine	Cassiar Rd
Telegraph Crk	28 - Stikine	Telegraph Rd
Shames Mnt	26 - Skeena	Shames Rd
Greenville-Kincolith	26 - Skeena	Hwy 113
Bella Coola	17 – Central Cariboo	Hwy 20
Wells	18 – North Cariboo	Hwy 26
Apex/Alpine	8 – South Okanagan	Apex Road
Duffy Lake	4 – Howe Sound	Hwy 99
Coquihalla	14 – Nicola	Hwy 5
Allison Pass	7 - Fraser Valley	Hwy 3
Fraser Canyon	7-14- Fraser Valley/Nicola	Hwy 1
Kootenay Pass	10 – Central Kootenay	Hwy 3
Blueberry-Paulson	9 – Kootenay Boundary	Hwy 3
Revelstoke-Glacier	12 – Selkirk	Hwy 1
Golden	12-- Selkirk	Hwy 1
Revelstoke West	12 – Selkirk	Hwy 1
Mica South	12 – Selkirk	Hwy 23
Galena Pass	12 – Selkirk	Hwy 31
Lardeau	10 – Central Kootenay	Hwy 31
New Denver-Kaslo	10 – Central Kootenay	Hwy 31A
Whitewater	10 – Central Kootenay	Whitewater Road
Toby Creek	11 – East Kootenay	Toby Creek Road

MOTI Explosives Transportation Guide

While Avalanche and Weather Program uses a limited number of types of explosives in its avalanche control operations, not every avalanche area uses the same type. The table below indicates the common type of explosive used by a given area.

CC = Case Charge

HC = Helicopter Control

Avalanche Area	Control Type	Explosives Class
Bear Pass	HC, CC	1.1D, 1.1B, 1.5D
Ningunsaw Pass	HC	1.1D, 1.1B, 1.5D
Terrace-Tyee	CC, HC	1.1D, 1.1B, 1.5D
Doris Lake	CC	1.1D, 1.1B, 1.5D
Moose Pasture	CC	1.1D, 1.1B, 1.5D
Cassiar	HC, CC	1.1D, 1.1B, 1.5 D
Telegraph Crk	HC, CC	1.1D, 1.1B, 1.5D
Shames Mnt	HC	1.1D, 1.1B, 1.5D
Greenville-Kincolith	HC	1.1D, 1.1B, 1.5D
Bella Coola	HC	1.1D, 1.1B, 1.5D
Wells	HC	1.1D, 1.1B, 1.5D
Apex/Alpine	HC	1.1D, 1.1B, 1.5D
Duffy Lake	HC	1.1D, 1.1B, 1.5D
Coquihalla	HC,CC	1.1D, 1.1B,1.5D
Allison Pass	HC,CC	1.1D, 1.1B, 1.5D
Fraser Canyon	HC,CC	1.1D, 1.1B, 1.5D
Hemlock Road	HC,CC	1.1D, 1.1B, 1.5D
Kootenay Pass	HC, CC	1.1D, 1.1B, 1.5D
Blueberry-Paulson	HC, CC	1.1D, 1.1B, 1.5D
Revelstoke-Glacier	HC, CC, Av-Guard	1.1D, 1.1B, 1.5D
Golden	HC	1.1D, 1.1B, 1.5D
Revelstoke West	HC, Wyssen Tower	1.1D, 1.1B, 1.5D
Mica South	HC	1.1D, 1.1B, 1.5D
Galena Pass	HC	1.1D, 1.1B, 1.5D
Lardeau	HC	1.1D, 1.1B, 1.5D
New Denver-Kaslo	HC	1.1D, 1.1B, 1.5D
Whitewater	HC	1.1D, 1.1B, 1.5D
Toby Creek	HC	1.1D, 1.1B, 1.5D

Emergency Response Plan Personnel

1. *Transportation Management Centre*

- Is a key element in the initial communication of this plan
- Provides and coordinates radio communication essential for all phases of emergency response outlined in Section I of this plan

2. *Senior Avalanche Officer*

- **ERAP Holder**
- Responsible for annual review
- Plan Maintenance and Training

3. *Avalanche Technicians*

- Act as **Technical Advisors** in this plan
- They are TDG (Transportation of Dangerous Goods) Certified
- Oversee maintenance of response equipment caches
- ERAP training

4. *District Manager of Transportation or designate*

- Acts as the Response Leader (Incident Commander) in this plan

5. *Ministry Area Manager or Contractor Road Supervisor*

- Acts as the Task Force Team Leader in this plan

6. *Maintenance Contractor*

- Acts as Strike Team Members
- The Maintenance Contractor will initiate a road closure to seal off the hazard area at the request of one of the following personnel:
 - District Manager of Transportation
 - Ministry Snow Avalanche Technician
 - Ministry Area Manager.
- Provides personnel who have been trained in accordance with existing regulations for the Transportation of Dangerous Goods, material identification and risk assessment.
- Provides sweeps between road closure locations, provides traffic control personnel, and makes all arrangements to maintain the road closure.
- Cooperatively responds to all directions from the:
 1. Response (Incident Commander) Leader
 2. Task Force Team Leader
 3. Technical Advisor
 4. RCMP
 5. CANUTEC

Emergency Response Plan Personnel continued

- Supplies and transports all necessary materials and equipment required for clean-up at the incident site.
- Assists as requested by the Incident Site Commander to participate in the explosive materials clean-up and transfer as necessary.

Response Plan Training

Training and Tabletop sessions will be held with involved personnel annually to ensure everyone is aware of their respective roles and responsibilities. These training sessions will be coordinated by Avalanche and Weather Programs HQ for Transportation Management Centre personnel and by District Avalanche Technicians for Ministry and Maintenance Contractor personnel. Training session will be conducted in the fall, prior to the winter avalanche season. Training sessions for District programs will be covered during pre-winter meetings. A record of personnel who attend these sessions will be kept along with meeting minutes and available for audit purposes as may be requested.

Response Plan Maintenance

This emergency response assistance plan has been written by the Ministry, Avalanche and Weather Programs Headquarters' office based in Nelson, BC. Avalanche and Weather Programs will revise and update this plan as necessary. Any inquiries can be directed to the Manager, Avalanche and Weather Programs.

Potential Incident Analysis **(Hazard Analysis Scenarios)**

Incident Site Scenario	Consequences of Incident	Action at Scene	By Whom
Minor MVA - no scattered explosives	possible injuries of occupants of the vehicle	medical attention	MoTI, Maint. Cont., Ambulance Attendees
	traffic disruptions	road closure and/or detour	MoTI, Maint. Cont.
	potential for theft	lock tailgate and/or shipping containers	Avalanche Technician
MVA with scattered explosives	possible injuries or death to occupants of vehicle	medical attention	MoT, Maint. Cont., Ambulance Attendees
	risk to vehicle traffic - public safety from scattered explosives	road closures and/or detour	MoTI, Maint. Cont.
	disruption of public and commercial traffic until explosives picked up and removed	identify, search, locate, recover, repack and/or dispose of scattered explosives	MoTI, Maint. Contractor personnel
	potential for theft	evacuation of non-essential personnel from incident site	MoTI, Maint. Contractor personnel
MVA with fire, scattered explosives but no detonations	possible injuries or death to occupants of vehicle	medical attention	MoTI, Maint. Cont., Ambulance Attendees
	fire	fire suppression	first responders, Fire Dept.
	risk to vehicle traffic and public safety	road closure and/or detour	MoTI, Maint. Contractor personnel
	disruption of public and commercial traffic	identify, search, locate, recover, repack and/or dispose of scattered explosives	MoTI, Maint. Contractor personnel
	Risk of detonation if scattered explosives become exposed to fire	remove explosives from areas exposed to potential fire risk	MoTI, Maint. Contractor
		Fire suppression	
		Evacuation of incident site	
	Questions re: type and quantity of explosives in shipment	Refer to TDG documents with driver or in vehicle	MoTI, Maint. Contractor
	potential for theft	evacuation of non-essential personnel from incident site	MoTI, Maint. Contractor

Explosive Spill on Highway
Emergency Response Assistance Plan - 2-0804

Incident Site Scenario	Consequences of Incident	Action at Scene	By Whom
MVA with fire, scattered explosives, and detonations	injuries and/or death from MVA and detonations	medical assistance	MoTI, Maint. Cont., Ambulance Attendees
	fire	fire suppression as approved by Technical Advisor and/or CANUTEC	fire responders, Fire Dept.
	Risk to vehicle traffic and public safety	road closures and/or detour and/or evacuation	MoTI, Maint. Cont., RCMP, EMBC
	Private and commercial property damage	evacuate buildings at risk	MoTI, Maint. Cont., RCMP, EMBC
	Questions re: type and quantity of explosives in shipment	Refer to TDG documents with driver or other vehicle occupants or in vehicle (if possible)	MoTI, Maint. Contractor
	Risk of detonation if scattered explosives become exposed to fire	remove explosives from areas exposed to potential fire risk	MoTI, Maint. Contractor
	Disruption of public and commercial traffic until explosives picked up and removed	identify, search, locate, recover, repack and/or dispose of scattered explosives	MoTI, Maint. Contractor personnel
	Potential for theft	evacuation of non-essential personnel from incident site	MoTI, Maint. Contractor
	Media attention	designated spokesperson	District Manager of Transportation or designate as selected by MoTI Executive
	Public-Govt. inquiry	major incident investigation	WSBC, MoTI, Transport Canada, other agencies



ERAP Spill Kit sample



Div: EVANinc

Explosives
EXPERTS
Explosifs

533, Argenteuil
LACHUTE, Québec
Canada J8H 3Y2

Tel.: 450 566-0655
Fax: 450 566-0677
Web: www.cilexplosives.com

BC MOTI Avalanche & Weather Program

CONFIRMED January 2021

To Whom it may concern,

Provision of Assistance Relating to BC MOTI Avalanche & Weather Emergency Response Plan

Reference:

1. Please be advised that in the event of a transportation related emergency involving CIL/Austin Powder supplied product, CIL is prepared to offer our customer BC MOTI Avalanche and Weather Program assistance in the following areas, Subject to your agreement at the time and subject to the availability of relevant resources.
 - Where reasonably available CIL/ Austin Powder will provide manpower and equipment for the transfer and or recovery of explosives. We will also offer appropriate technical advice where available.
2. Notwithstanding the above BC MOTI Avalanche and Weather Program would be expected to take overall responsibility for leading the response (i.e. alerting authorities, co- ordinating activities at the scene etc.)
3. CIL/ Austin Powder does not accept liability for acts or omissions of any third party. Any cost associated with requesting any response by us to an emergency, on BC MOTI Avalanche and Weather Programs behalf will be charged to your account.
4. The most effective way for us to assist you would be to enact our emergency response plan whereby we would contact our primary response personal directly. This can be facilitated by phoning our 24/7 emergency response number at 800-424-9300
5. If you require any further information, please do not hesitate to contact me at any of the numbers below.



Explosives
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Braden Schmidt
Avalanche Control Consultant

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Material Safety Data Sheets
For Explosives Use
MOTI Avalanche and Weather Programs

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- Pentex
- Cast Boosters
- MIL Det
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Pentex™ D

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

Revision Date: 11/02/2018

Date of Issue: 04/08/2015

Supersedes Date: 06/08/2018

Version: 3.0

SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Mixture

Product Name: Pentex™ D

Product Code: 4009

Intended Use of the Product

Used for initiation of explosive mixtures. For professional use only.

Name, Address, and Telephone of the Responsible Party

Canada:

Orica Canada Inc.
301 Rue Hotel-de-Ville
Brownsburg-Chatham, QC
J8G 3B5
For SDS Requests:
1-855-26-ORICA (1-855-266-7422)
sds.na@orica.com
www.oricamining services.com

Mexico:

Orica Mexico Inc.
Boulevard Harold R. Pape No. 350
Colonia Telefonistas
Monclova, Coahuila.
C.P. 25758
For SDS Requests: 1-855-26-ORICA (1-855-266-7422)
sds.na@orica.com

USA:

Orica USA Inc.
33101 E. Quincy Avenue
Watkins, CO 80137-9406
For SDS Requests: 1-855-26-ORICA (1-855-266-7422)
sds.na@orica.com

USA:

Orica USA Inc.
33101 E. Quincy Avenue
Watkins, CO 80137-9406
For SDS Requests: 1-855-26-ORICA (1-855-266-7422)
sds.na@orica.com

Mexico:

Orica Mexico Inc.
Boulevard Harold R. Pape No. 350
Colonia Telefonistas
Monclova, Coahuila.
C.P. 25758

Emergency Telephone Number

Emergency Number : **Canada:** 1-877-561-3636 (Orica Transportation Emergency Response)
USA: 1-800-424-9300 (CHEMTREC)
IN MEXICO CALL: 01-800- 002-1400

FOR CHEMICAL EMERGENCIES (24 HOUR) INVOLVING TRANSPORTATION, SPILL, LEAK, RELEASE, FIRE OR ACCIDENTS: **IN CANADA CALL:** THE ORICA TRANSPORTATION EMERGENCY RESPONSE SYSTEM AT **1-877-561-3636**. **IN THE U.S. CALL: CHEMTREC 1-800-424-9300**. **IN THE U.S.:** FOR LOST, STOLEN, OR MISPLACED EXPLOSIVES CALL: BATF **1-800-800-3855**. FORM ATF F 5400.5 MUST BE COMPLETED AND LOCAL AUTHORITIES (STATE/MUNICIPAL POLICE, ETC.) MUST BE ADVISED.

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS-US/CA Classification

The explosive classification below only applies to US 29 CFR 1910.1200 (HCS/HazCom 2012). The explosive classification is excluded from Canada Hazardous Products Regulations (HPR, SOR/2015-17), it is regulated under the Canada Explosives Act (R.S.C., 1985, c. E-17)

Expl. 1.1	H201
Acute Tox. 3 (Oral)	H301
Acute Tox. 3 (Dermal)	H311
Acute Tox. 3	H331
(Inhalation:dust,mist)	
STOT SE 1	H370
STOT RE 2	H373

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Aquatic Acute 2 H401

Aquatic Chronic 2 H411

Full text of hazard classes and H-statements : see section 16

Label Elements

GHS-US/CA Labeling

Any labeling elements (pictograms, signal word, hazard, and precautionary statements) related to explosive classifications apply to the OSHA Hazard Communication Standard (HCS, 29 CFR 1910.1200) only and are excluded from Canada's Hazardous Products Regulations (HPR, SOR/2015-17)

Hazard Pictograms (GHS-US/CA)



Signal Word (GHS-US/CA)

: Danger

Hazard Statements (GHS-US/CA)

: H201 - Explosive; mass explosion hazard.
H301+H311+H331 - Toxic if swallowed, in contact with skin or if inhaled.
H370 - Causes damage to organs.
H373 - May cause damage to organs through prolonged or repeated exposure.
H401 - Toxic to aquatic life.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary Statements (GHS-US/CA)

: P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 - Ground/bond container and receiving equipment.
P250 - Do not subject to grinding/shock/friction.
P260 - Do not breathe dust, fume.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor.
P302+P352 - IF ON SKIN: Wash with plenty of water.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P311 - IF exposed or concerned: Call a POISON CENTER or doctor.
P312 - Call a POISON CENTER or doctor if you feel unwell.
P314 - Get medical advice/attention if you feel unwell.
P321 - Specific treatment (see section 4 on this SDS).
P330 - Rinse mouth.
P361+P364 - Take off immediately all contaminated clothing and wash it 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.
P401 - Store in accordance with the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR part 555.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR part 555.

Other Hazards

Exposure may aggravate pre-existing eye, skin, or respiratory conditions. Overexposure may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being

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slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia.

Unknown Acute Toxicity (GHS-US/CA)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	% *
2,4,6-Trinitrotoluene	(CAS-No.) 118-96-7	30 - 80
Pentaerythrite tetranitrate	(CAS-No.) 78-11-5	20 - 70
Cyclonite	(CAS-No.) 121-82-4	20 - 70
Cyclotetramethylenetetranitramine	(CAS-No.) 2691-41-0	20 - 70
Aluminum	(CAS-No.) 7429-90-5	<= 25

*Percentages are listed in weight by weight percentage (w/w%) for liquid and solid ingredients. Gas ingredients are listed in volume by volume percentage (v/v%).

SECTION 4: FIRST AID MEASURES

Description of First-aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. First, take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate respiratory protective equipment, use the buddy system), then remove the exposed person to fresh air. Keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Get immediate medical advice/attention.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor.

Most Important Symptoms and Effects Both Acute and Delayed

General: Toxic if swallowed. Toxic in contact with skin. Toxic if inhaled. Causes damage to organs (central nervous system). Overexposure to this material may result in methemoglobinemia. Methemoglobinemia decreases the blood's ability to carry oxygen and results in symptoms such as dizziness, drowsiness, headache, shortness of breath, blue skin and lips, rapid heart rate, unconsciousness, and possibly death. There are potential chronic health effects to consider.

Inhalation: Inhalation of this material can cause serious health effects in small amounts, leading to unconsciousness and death.

Skin Contact: This material is toxic in small amounts through skin contact, and can cause adverse health effects or death. This material may be absorbed through the skin and eyes.

Eye Contact: May cause slight irritation to eyes.

Ingestion: This material is toxic in small amounts orally, and can cause adverse health effects or death.

Chronic Symptoms: May cause damage to organs (liver, eyes, circulatory system, central nervous system) through prolonged or repeated exposure.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product SDS or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Water may be applied through fixed extinguishing system (sprinklers) as long as people need not be present for the system to operate.

Unsuitable Extinguishing Media: DO NOT fight fires involving explosives.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Explosive, could cause fire and secondary explosions.

Explosion Hazard: Explosives, Division 1.1 - Chemicals and items which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously).

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Reactivity: Extreme risk of explosion by shock, friction, fire or other sources of ignition.

Advice for Firefighters

Precautionary Measures Fire: This product is an explosive with mass detonation hazard. DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS.

Firefighting Instructions: DO NOT ATTEMPT TO FIGHT FIRE. Immediately evacuate all personnel from the area to a safe distance. Guard against re-entry. Thermal decomposition can lead to release of irritating gases and vapors.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO₂). Nitrogen oxides. Metal oxides.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections

Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Evacuate danger area. Avoid all contact with skin, eyes, or clothing.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Evacuate danger area.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area. Eliminate ignition sources.

Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage.

Methods and Materials for Containment and Cleaning Up

For Containment: Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams. Absorb and contain with inert material. Place contents in suitable container for disposal. As an immediate precautionary measure, isolate spill or leak area in all directions. Ventilate area.

Methods for Cleaning Up: Use only non-sparking tools. Be careful to avoid shock, friction, and contact with grit. Collect product for recovery or disposal. For release to land, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Collect contaminated soil and water, and absorbent for proper disposal. Notify applicable government authority if release is reportable or could adversely affect the environment.

Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Keep away from sources of ignition - No smoking. Handle empty containers with care because they may still present a hazard. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Use only outdoors or in a well-ventilated area. Avoid contact with skin, eyes and clothing.

Hygiene Measures: This product is an explosive and should only be used under the supervision of trained and licensed personnel. Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment.

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Storage Conditions: Store as defined by the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR Part 555. Comply with applicable regulations. Store under moderate temperatures recommended by competent authority. Store under dry conditions in a well ventilated magazine that has been approved for explosive storage. Do NOT store explosives in a detonator magazine or detonators in an explosive magazine. Keep away from heat, spark 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. Isolate from incompatibles. Store locked up.

Incompatible Materials: Oxidizable materials, metal powder, bronze & copper alloys, fuels (e.g. lubricants, machine oils), fluorocarbon lubricants, acids, corrosive liquids, chlorate, sulphur, sodium nitrite, charcoal, coke and other finely divided combustibles. Strong oxidizing and reducing agents. Ingredients within initiator are incompatible with acids, alkalis, oxidizers and caustics.

Storage Temperature: 10 - 27 °C (50 - 80 °F)

Special Rules on Packaging: Keep only in the original container.

Specific End Use(s)

Used for initiation of explosive mixtures. For professional use only.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), or Canadian provincial governments.

2,4,6-Trinitrotoluene (118-96-7)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.1 mg/m ³
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route
USA ACGIH	Biological Exposure Indices (BEI)	1.5 % of hemoglobin Parameter: Methemoglobin - Medium: blood - Sampling time: during or end of shift (background, nonspecific, semi-quantitative)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1.5 mg/m ³
USA OSHA	Limit value category (OSHA)	prevent or reduce skin absorption
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.5 mg/m ³
USA IDLH	US IDLH (mg/m ³)	500 mg/m ³
Alberta	OEL TWA (mg/m ³)	0.1 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.1 mg/m ³
Manitoba	OEL TWA (mg/m ³)	0.1 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	0.1 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.1 mg/m ³
Nova Scotia	OEL TWA (mg/m ³)	0.1 mg/m ³
Nunavut	OEL STEL (mg/m ³)	0.3 mg/m ³
Nunavut	OEL TWA (mg/m ³)	0.1 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	0.3 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	0.1 mg/m ³
Ontario	OEL TWA (mg/m ³)	0.1 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	0.1 mg/m ³
Québec	VEMP (mg/m ³)	0.5 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	0.3 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.1 mg/m ³
Yukon	OEL Ceiling (mg/m ³)	0.5 mg/m ³
Cyclonite (121-82-4)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route, Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1.5 mg/m ³

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USA NIOSH	NIOSH REL (STEL) (mg/m ³)	3 mg/m ³
Alberta	OEL TWA (mg/m ³)	0.5 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.5 mg/m ³
Manitoba	OEL TWA (mg/m ³)	0.5 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	0.5 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.5 mg/m ³
Nova Scotia	OEL TWA (mg/m ³)	0.5 mg/m ³
Nunavut	OEL STEL (mg/m ³)	1.5 mg/m ³
Nunavut	OEL TWA (mg/m ³)	0.5 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	1.5 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	0.5 mg/m ³
Ontario	OEL TWA (mg/m ³)	0.5 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	0.5 mg/m ³
Québec	VEMP (mg/m ³)	1.5 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	1.5 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.5 mg/m ³
Yukon	OEL STEL (mg/m ³)	3 mg/m ³
Yukon	OEL TWA (mg/m ³)	1.5 mg/m ³
Aluminum (7429-90-5)		
USA ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
Alberta	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
British Columbia	OEL TWA (mg/m ³)	1 mg/m ³ (respirable)
Manitoba	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³ (metal dust)
Newfoundland & Labrador	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Nunavut	OEL STEL (mg/m ³)	20 mg/m ³ (metal-dust)
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³ (metal-dust)
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³ (metal-dust)
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³ (metal-dust)
Ontario	OEL TWA (mg/m ³)	1 mg/m ³ (respirable)
Prince Edward Island	OEL TWA (mg/m ³)	1 mg/m ³ (respirable particulate matter)
Québec	VEMP (mg/m ³)	10 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³ (dust)
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³ (dust)

Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Proper grounding procedures to avoid static electricity should be followed. Use approved electrical equipment. Gas detectors should be used when toxic gases may be released.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection. Face shield.



Materials for Protective Clothing: Chemically resistant materials and fabrics.

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Hand Protection: Wear protective gloves.

Eye and Face Protection: Chemical safety goggles or safety glasses with side shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Not available
Odor	: Not available
Odor Threshold	: Not available
pH	: Not available
Evaporation Rate	: Not available
Melting Point	: 80.8 °C (176.18 °F)
Freezing Point	: Not available
Boiling Point	: Not available
Flash Point	: Not available
Auto-ignition Temperature	: Not available
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not available
Lower Flammable Limit	: Not available
Upper Flammable Limit	: Not available
Vapor Pressure	: Not available
Relative Vapor Density at 20°C	: Not available
Relative Density	: Not available
Density	: 1.5 - 1.7 g/cc
Specific Gravity	: 1.5 - 1.7
Solubility	: Not available
Partition Coefficient: N-Octanol/Water	: Not available
Viscosity	: Not available
Explosive Properties	: Explosives, Division 1.1 - Chemicals and items which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously)

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Extreme risk of explosion by shock, friction, fire or other sources of ignition.

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

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Keep away from open flames, hot surfaces and sources of ignition. Incompatible materials.

Incompatible Materials: Oxidizable materials, metal powder, bronze & copper alloys, fuels (e.g. lubricants, machine oils), fluorocarbon lubricants, acids, corrosive liquids, chlorate, sulphur, sodium nitrite, charcoal, coke and other finely divided combustibles. Strong oxidizing and reducing agents. Ingredients within initiator are incompatible with acids, alkalis, oxidizers and caustics.

Hazardous Decomposition Products: None expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity (Oral): Oral: Toxic if swallowed.

Acute Toxicity (Dermal): Dermal: Toxic in contact with skin.

Pentex™ D

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

Acute Toxicity (Inhalation): Inhalation:dust,mist: Toxic if inhaled.

LD50 and LC50 Data:

Pentex™ D	
ATE US/CA (oral)	71.00 mg/kg body weight
ATE US/CA (dermal)	300.00 mg/kg body weight
ATE US/CA (dust, mist)	0.63 mg/l/4h

Skin Corrosion/Irritation: Not classified

Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure.

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Causes damage to organs.

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: Inhalation of this material can cause serious health effects in small amounts, leading to unconsciousness and death.

Symptoms/Injuries After Skin Contact: This material is toxic in small amounts through skin contact, and can cause adverse health effects or death. This material may be absorbed through the skin and eyes.

Symptoms/Injuries After Eye Contact: May cause slight irritation to eyes.

Symptoms/Injuries After Ingestion: This material is toxic in small amounts orally, and can cause adverse health effects or death.

Chronic Symptoms: May cause damage to organs (liver, Eyes, circulatory system, central nervous system) through prolonged or repeated exposure.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

2,4,6-Trinitrotoluene (118-96-7)	
LD50 Oral Rat	795 mg/kg
ATE US/CA (oral)	100.00 mg/kg body weight
ATE US/CA (dermal)	300.00 mg/kg body weight
ATE US/CA (dust, mist)	0.50 mg/l/4h
Pentaerythrite tetranitrate (78-11-5)	
LD50 Oral Rat	1660 mg/kg
Cyclonite (121-82-4)	
LD50 Oral Rat	71 mg/kg
Cyclotetramethylenetetranitramine (2691-41-0)	
LD50 Oral Rat	1670 mg/kg
LD50 Dermal Rat	982 mg/kg (Species: New Zealand White)
LD50 Dermal Rabbit	634 mg/kg
2,4,6-Trinitrotoluene (118-96-7)	
IARC Group	3

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecology - General: Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

2,4,6-Trinitrotoluene (118-96-7)	
EC50 Daphnia 1	0.26 mg/l
NOEC Chronic Crustacea	0.48 mg/l
Cyclonite (121-82-4)	
LC50 Fish 1	11.14 - 14.97 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
LC50 Fish 2	5.6 - 10 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [flow-through])
NOEC Chronic Fish	1.4 mg/l

Pentex™ D

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

Cyclotetramethylenetetranitramine (2691-41-0)	
LC50 Fish 1	8.8 - 26 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
LC50 Fish 2	> 32 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

Persistence and Degradability

Pentex™ D	
Persistence and Degradability	May cause long-term adverse effects in the environment.

Bioaccumulative Potential

Pentex™ D	
Bioaccumulative Potential	Not established.
2,4,6-Trinitrotoluene (118-96-7)	
Log Pow	1.6 (at 20 °C)
Cyclonite (121-82-4)	
Log Pow	0.87 (@ 23 °C/73.4 °F)

Mobility in Soil Not available

Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Destroy and dispose of in accordance with applicable local, state, provincial, territorial, federal and international regulations. Consult with an Orica technical representative.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions.

Ecology - Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

In Accordance with DOT

Proper Shipping Name : BOOSTERS
Hazard Class : 1.1D
Identification Number : UN0042
Label Codes : 1.1D
Packing Group : II
Marine Pollutant : Marine pollutant



In Accordance with IMDG

Proper Shipping Name : BOOSTERS
Hazard Class : 1.1D
Identification Number : UN0042
Label Codes : 1.1D
EmS-No. (Fire) : F-B
EmS-No. (Spillage) : S-X
Marine pollutant : Marine pollutant
MFAG Number : 112



In Accordance with IATA

Proper Shipping Name : BOOSTERS
Hazard Class : 1.1D
Identification Number : UN0042
ERG Code (IATA) : 1L

In Accordance with TDG

Proper Shipping Name : BOOSTERS
Hazard Class : 1.1D
Identification Number : UN0042

Pentex™ D

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

Label Codes : 1.1D



Packing Group : II

Marine Pollutant (TDG) : Marine pollutant

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Pentex™ D	
SARA Section 311/312 Hazard Classes	Health hazard - Specific target organ toxicity (single or repeated exposure) Health hazard - Acute toxicity (any route of exposure) Health hazard - Hazard Not Otherwise Classified (HNOC) Physical hazard - Explosive
2,4,6-Trinitrotoluene (118-96-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Pentaerythrite tetranitrate (78-11-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.
Cyclonite (121-82-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Cyclotetramethylenetetranitramine (2691-41-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Aluminum (7429-90-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 % (dust or fume only)

US State Regulations

2,4,6-Trinitrotoluene (118-96-7)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.
2,4,6-Trinitrotoluene (118-96-7)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List	
Pentaerythrite tetranitrate (78-11-5)	
U.S. - New Jersey - Right to Know Hazardous Substance List	
Cyclonite (121-82-4)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List	
Cyclotetramethylenetetranitramine (2691-41-0)	
U.S. - New Jersey - Right to Know Hazardous Substance List	
Aluminum (7429-90-5)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List	

Canadian Regulations

Pentex™ D

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

2,4,6-Trinitrotoluene (118-96-7)

Listed on the Canadian DSL (Domestic Substances List)

Pentaerythrite tetranitrate (78-11-5)

Listed on the Canadian DSL (Domestic Substances List)

Cyclonite (121-82-4)

Listed on the Canadian DSL (Domestic Substances List)

Cyclotetramethylenetetranitramine (2691-41-0)

Listed on the Canadian DSL (Domestic Substances List)

Aluminum (7429-90-5)

Listed on the Canadian DSL (Domestic Substances List)

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 11/02/2018

Revision

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Products Regulations (HPR) SOR/2015-17.

GHS Full Text Phrases:

Expl. 1.1	Explosive Category 1.1
H201	Explosive; mass explosion hazard
Acute Tox. 3 (Dermal)	Acute toxicity (dermal) Category 3
Acute Tox. 3 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 3
Acute Tox. 3 (Oral)	Acute toxicity (oral) Category 3
Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
STOT SE 1	Specific target organ toxicity (single exposure) Category 1
H301	Toxic if swallowed
H311	Toxic in contact with skin
H331	Toxic if inhaled
H370	Causes damage to organs
H373	May cause damage to organs through prolonged or repeated exposure
H401	Toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects

All information contained herein and in any supporting documents is provided for informational purposes only and is as accurate and up-to-date as possible at the time of publication. Since Orica and its related entities cannot anticipate or control the conditions under which this information may be used, users must review this information in the specific context of the intended application and must make their own determinations as to the suitability of this information for such users' purposes. To the maximum extent permitted by law, nothing contained herein and in any supporting documents shall be deemed to be an express or implied warranty, and Orica expressly disclaims all warranties and representations, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Orica will not be responsible for any loss whatsoever resulting from any use or reliance upon this information.

NA GHS SDS 2015 (Can, US)

Material Safety Data Sheet



/ORION

Fuse Assembly

May be used to comply with OSHA's Hazard Communication Standard,
29CFR 1910. 1200. Standard must be consulted for specific requirements.

QUICK IDENTIFIER

Common Name: (used on label and list)

MIL-DETS, FUSE ASSY

SECTION 1 -

Manufacturer's

Name **Made exclusively for CIL/Orion**

Address

533 Argenteuil

Emergency

Telephone No.

(800) 255-3924

City, State, and ZIP

Lachute Quebec Canada J8H 3Y2

Other

Information

Calls

(800) 277-6664

Signature of Person

Responsible for Preparation (Optional)

Date

Prepared

2002MAY21

SECTION 2 - HAZARDOUS INGREDIENTS / IDENTITY

Hazardous Component(s) (chemical & common name(s))

OSHA
PELACGIH
TLVOther Exposure
Limits%
(optional)CAS
NO.*A device assembled from the following parts:**Fuse, Safety, Core of black powder mixture (approx. 7 G/M) wrapped in polyethylene**Blasting Cap, fuse type. An aluminum shell (1/4" dia x 1-3/4" long) containing:**Pentaerythrite Tetranitrate*

800 mg

Lead Azide Stryphnate

200 mg

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICSBoiling
Point

N/A

Specific

Gravity (H₂O = 1)

N/A

Vapor

Pressure (mm Hg)

N/A

Vapor

Density (Air = 1)

N/A

Solubility
in Water

Negligible

Reactivity in
Water

N/A

Appearance
and Odor

OD Green Cord with Aluminum Shell, Odorless

Melting
Point

N/A

SECTION 4 - FIRE & EXPLOSION DATA

Flash

Point *Not Determined*

Method

Used

N/A

Flammable Limits

in Air % by Volume

N/A

LEL

Lower

UEL

Upper

Auto-ignition

Temperature *No explosion after 48 hours at 75C*Extinguisher
Media*Do not try to extinguish the flames. Isolate the area and evacuate personnel.*

Special Fire

Fighting Procedures

*Do not fight the fire.*Unusual Fire and
Explosion Hazards*Fuse Assemblies will burn with extremely hot flames and explode when set on fire or subjected to sparks or impact.**Protect from impact, friction, heat, sparks or flame.*

QUICK IDENTIFIER

Common Name: (used on label and list)

MIL-DETS, FUSE ASSY

SECTION 5 - PHYSICAL HAZARDS (REACTIVITY DATA)

Stability Unstable ☒ Conditions to Avoid

Protect from Impact, friction, heat, sparks or flame.

Incompatibility (Materials to Avoid) No known chemical incompatibility

Hazardous Decomposition Products Produces Nitrogen Oxides when Detonated

Hazardous Polymerization May Occur ☒ Conditions to Avoid

SECTION 6 - HEALTH HAZARDS

1. Acute

2. Chronic

None

None

Signs and Symptoms of Exposure Health hazards of the mixture contained within this article are the same as those of the individual ingredients. Refer to individual MSDS from manufacturers for more specific data on each ingredient.

Medical Conditions Generally Aggravated by Exposure

Chemical Listed as Carcinogen or Potential Carcinogen

National Toxicology Program Yes ☒ No ☒I.A.R.C. Monographs Yes ☒ No ☒OSHA Yes ☒ No ☒

Emergency and First Aid Procedures In case of Injury Sustained by Detonation, Seek Emergency Medical Care. In case of fire for Eyes and Skin Burns, contact a physician

The components & ingredients of the device are enclosed in a plastic covering, preventing respiratory, ingestion & skin exposure.

ROUTES OF ENTRY

- Inhalation Only if released from plastic covering.
- Eyes Only if released from plastic covering
- Skin Only if released from plastic covering
- Ingestion Only if released from plastic covering.

SECTION 7 - SPECIAL PRECAUTIONS AND SPILL / LEAK PROCEDURES

Precautions to be Taken In Handling and Storage Store in a cool, dry place. Store according to BATF Regulations for detonators. Do not store

with high explosives such as dynamite, etc. Transport according to US DOT Regulations for 1.4B explosives.

Other Precautions The chemical mixture contained within this article is considered reactive and should be disposed of as reactive hazardous waste in accordance with all applicable state and federal regulations.

Steps to be Taken In Case Material is Released or Spilled Review fire and explosion safety procedures before starting clean up operation. Wear appropriate personnel protection clothing.

Waste Disposal Methods (Consult Federal, State, and Local Regulations) The disposal or destruction of excess, damaged or deteriorated explosives should be carried out under the direct supervision of a qualified person.

SECTION 8 - SPECIAL PROTECTION INFORMATION / CONTROL MEASURES

Respiratory Protection (Specify Type) N/A

Ventilation Local Exhaust N/A Mechanical (General) N/A Special N/A Other N/A

Protective Gloves Yes Eye Protection Safety glasses

Other Protective Clothing or Equipment Remove contaminated clothing promptly and clean before reuse. Discard leather articles.

Work/Hygiene Practices Wash thoroughly after handling. Avoid contamination of food, beverages, or smoking materials.

IMPORTANT

Do not leave any blank spaces. If required information is unavailable, unknown, or does not apply, so indicate.



MATERIAL SAFETY DATA SHEET

CAST BOOSTERS

DATE MAY 2011

MSDS NO. P-1 PAGE 1 OF 2

SECTION I		Issued by the Safety and Compliance Dept.																			
<p>Austin Powder Company 25800 Science Park Drive Cleveland, Ohio 44122</p> <p>CHEMTREC (24HR Emergency Telephone), call 1-800-424-9300- United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory). International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00). U.S. Maritime callers dial- 1-703-527-3887.</p> <p>For non-emergency assistance, call 216-464-2400</p>		<p>TRADE NAME AND SYNONYMS</p> <p>ACP Boosters: Orange Cap, Orange Cap DC, Orange Cap R, Red Cap, Black Cap, Black Cap DC, Brown Cap, Green Cap, Purple Cap, White Cap, White Cap DC, Gray Cap, etc.</p> <p>NDS Boosters, ADP Boosters, Gold Nugget, Silver Nugget, Diamond Nugget, DES Series, DES Pentolite Charges, Rock Crushers, 60 Gram, 90 Gram, 110 Gram, DES Shaped Charges, Prime Gel*, Renforcatuers, HDP 150, HDP 400, HDP 400LP, HDP 450, Snow Launcher Series, Avalanche Guard, Hornet Series, Enviroprime Series, Electro Star Series, E-Star Series, Seisprime Series and Oil Well Special Series.</p>																			
SECTION II HAZARDOUS INGREDIENTS																					
<p>Formulated with TNT and an explosive sensitizer such as PETN, RDX and/or HMX.</p> <table><tr><td>TNT, Trinitrotoluene, C₇H₅N₃O₆,</td><td>CAS No. 118-96-7</td><td>30% to 80% TNT</td></tr><tr><td>PETN, Pentaerythritol tetranitrate, C₅H₈N₄O₁₂,</td><td>CAS No. 78-11-5</td><td>20% to 70% PETN, RDX, and/or HMX.</td></tr><tr><td>HMX, Cyclotetramethylene tetranitramine, Octogen, C₄H₈N₈O₈,</td><td>CAS No. 261-41-0</td><td></td></tr><tr><td>RDX, Cyclotrimethylene trinitramine, Cyclonite, C₃H₆N₆O₆,</td><td>CAS No. 121-82-4</td><td></td></tr><tr><td>Aluminum, AL</td><td>CAS No. 7429-90-5</td><td>0% to 20% Aluminum</td></tr><tr><td>Pentolite is a 50/50 mixture of PETN and TNT.</td><td>CAS No. 8066-33-9</td><td></td></tr></table> <p>Orange Cap R and Electro Star boosters contain a brass sleeve.</p>				TNT, Trinitrotoluene, C ₇ H ₅ N ₃ O ₆ ,	CAS No. 118-96-7	30% to 80% TNT	PETN, Pentaerythritol tetranitrate, C ₅ H ₈ N ₄ O ₁₂ ,	CAS No. 78-11-5	20% to 70% PETN, RDX, and/or HMX.	HMX, Cyclotetramethylene tetranitramine, Octogen, C ₄ H ₈ N ₈ O ₈ ,	CAS No. 261-41-0		RDX, Cyclotrimethylene trinitramine, Cyclonite, C ₃ H ₆ N ₆ O ₆ ,	CAS No. 121-82-4		Aluminum, AL	CAS No. 7429-90-5	0% to 20% Aluminum	Pentolite is a 50/50 mixture of PETN and TNT.	CAS No. 8066-33-9	
TNT, Trinitrotoluene, C ₇ H ₅ N ₃ O ₆ ,	CAS No. 118-96-7	30% to 80% TNT																			
PETN, Pentaerythritol tetranitrate, C ₅ H ₈ N ₄ O ₁₂ ,	CAS No. 78-11-5	20% to 70% PETN, RDX, and/or HMX.																			
HMX, Cyclotetramethylene tetranitramine, Octogen, C ₄ H ₈ N ₈ O ₈ ,	CAS No. 261-41-0																				
RDX, Cyclotrimethylene trinitramine, Cyclonite, C ₃ H ₆ N ₆ O ₆ ,	CAS No. 121-82-4																				
Aluminum, AL	CAS No. 7429-90-5	0% to 20% Aluminum																			
Pentolite is a 50/50 mixture of PETN and TNT.	CAS No. 8066-33-9																				
SECTION III PHYSICAL DATA																					
BOILING POINT	Decomposes	VAPOR PRESSURE (mm Hg)	Negligible at 20°C																		
SPECIFIC GRAVITY (H ₂ O = 1)	1.65	VAPOR DENSITY (Air = 1)	N/A																		
PERCENT VOLATILE BY VOL. (%)	N/A	EVAPORATION RATE:	N/A																		
SOLUBILITY IN WATER:	0.15%																				
APPEARANCE AND ODOR: Solid yellow-buff cast crystalline material. No odor.																					
SECTION IV FIRE AND EXPLOSION DATA																					
FLASH POINT:	N/A																				
FLAMMABLE LIMITS:	N/A																				
EXTINGUISHING MEDIA:	See below																				
SPECIAL FIRE FIGHTING PROCEDURES:	Do not fight fires. Withdraw personnel immediately. Allow fire to burn itself out. Avoid toxic fumes from fire.																				
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to fire or shock.																				
SECTION V HEALTH HAZARD DATA																					
THRESHOLD LIMIT VALUE: ACGIH: TNT-Skin, 0.1 MG/M ³ PETN-None RDX-Skin, 1.5 MG/M ³ AL-10MG/M ³																					
OSHA : TNT-Skin, 1.5 MG/M ³ PETN-None RDX-None AL-15MG/M ³																					
EFFECTS OF OVEREXPOSURE: TNT ingestion may cause headache, weakness, anemia, or liver damage. Excessive skin contact may cause dermatitis and sensitization. PETN is a vasodilator. Ingestion of RDX may cause nervous system disorders or epileptiform seizures.																					
EMERGENCY AND FIRST AID PROCEDURES:																					
FUMES:	Remove to fresh air.																				
IF INGESTED:	Obtain medical attention immediately.																				



MATERIAL SAFETY DATA SHEET

CAST BOOSTERS

DATE MAY 2011

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PAGE 2 OF 2

SECTION VI REACTIVITY DATA

Issued by the Safety and Compliance Dept.

STABILITY: Stable under normal conditions. May explode when subjected to fire shock or friction.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with strong acids or alkalies.

Do not exceed 150°F (66°C).

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous nitrogen oxides and carbon oxides: Toxic decomposition products including carbon monoxide (CO) may migrate to off blast-site areas.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep up and dispose of all spilled material immediately. Do not permit smoking or open flames near spill site.

WASTE DISPOSAL METHOD: Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance. This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory): **CALL CHEMTREC** for emergencies only: 1-800-424-9300. **International callers**, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).

U.S. Maritime callers dial- 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION: Avoid breathing fumes from detonation.

VENTILATION: Not required under normal conditions.

PROTECTIVE GLOVES: Not required for normal handling of boosters.

EYE PROTECTION: Not required under normal conditions.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH THE SAFETY LIBRARY PUBLICATION NO. 4 "WARNINGS AND INSTRUCTIONS" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES.

TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS, BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

DOT or IMDG proper shipping description: Boosters, Without Detonator, 1.1D, UN 0042, PG II

None of the components are listed in the 1987 IARC Monographs, Group 1, 2A, or 2B as a known, probable or possible carcinogen, nor are they listed in the NTP annual report on carcinogens.

The Enviroprime Series contains 4 to 7 % of a bioremediation inoculant consisting of natural food products and a trace of a naturally occurring non-pathogenic bacterium.

*Prime Gel contains both a Cast Booster and Hydromite. Also see the Hydromite MSDS.



MATERIAL SAFETY DATA SHEET

DETONATING CORD

DATE MARCH 2011

MSDS NO. C-1 PAGE 1 of 2

SECTION I

Issued by the Safety and Compliance Dept.

Austin Powder Company
25800 Science Park Drive
Cleveland, Ohio 44122

TRADE NAME AND SYNONYMS

Lite Line, Scotch Cord, A-Cord, No. 40, No. 50
No. 60, No.80 etc. Seismic Detonating Cord, Slide Line Series,
Heavy Duty Series, Cordeau Detonant Fuse, Cord, Detonating,
Flexible, Special 18, 25, 30,40 and 50.Detonating Cord C3

CHEMTREC (24HR Emergency Telephone), call
1-800-424-9300- United States, Canada, Puerto Rico (U.S.
Commonwealth) and the Virgin Islands (U.S. Territory).
International callers, dial the U.S. access number followed by
1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887.

For non-emergency assistance, call
216-464-2400

SECTION II HAZARDOUS INGREDIENTS

PETN, Pentaerythritol tetranitrate, $C_5H_8N_4O_{12}$, CAS No. 78-11-5

SECTION III PHYSICAL DATA

BOILING POINT	N/A	VAPOR PRESSURE (mm Hg)	Negligible at 20°C
SPECIFIC GRAVITY ($H_2O = 1$)	1.76	VAPOR DENSITY (Air = 1)	N/A
PERCENT VOLATILE BY VOL. (%)	N/A	EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	Negligible		
APPEARANCE AND ODOR:	Flexible cord with an explosive core of PETN protected within a textile casing covered by a seamless polyethylene jacket. PETN is a white crystalline solid. No odor.		

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:	N/A
FLAMMABLE LIMITS:	N/A
EXTINGUISHING MEDIA:	See below
SPECIAL FIREFIGHTING PROCEDURES:	Do not fight fire. Withdraw personnel immediately. Allow fire to burn itself out.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to fire or shock. Avoid toxic fumes from fire.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: PETN-None
OSHA : PETN-None

EFFECTS OF OVEREXPOSURE: Ingestion of PETN may cause headache and nausea. PETN is a vasodilator and produces dilation of blood vessels.

EMERGENCY AND FIRST AID PROCEDURES:

FUMES:	Remove to fresh air.
IF INGESTED:	Obtain medical attention immediately.



MATERIAL SAFETY DATA SHEET

DETONATING CORD

DATE MARCH 2011

MSDS NO. C-1

PAGE 2 OF 2

SECTION VI REACTIVITY DATA

Issued by the Safety and Compliance Dept.

STABILITY: Stable under normal conditions. May explode when subjected to fire or shock.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with strong acids or alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous nitrogen oxides and carbon oxides: Toxic decomposition products including carbon monoxide (CO) may migrate to off blast-site areas.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep up and dispose of all spilled material immediately. Do not permit smoking or open flames near spill site.

WASTE DISPOSAL METHOD: Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance. This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory): **CALL CHEMTREC** for emergencies only: 1-800-424-9300. **International callers**, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00). **U.S. Maritime callers dial-** 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION: Not required under normal conditions.

VENTILATION: Not required under normal conditions.

PROTECTIVE GLOVES: Not required except to prevent abrasive injuries.

EYE PROTECTION: Not required under normal conditions.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH THE SAFETY LIBRARY PUBLICATION NO. 4 "WARNINGS AND INSTRUCTIONS" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES.

TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS, BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

DOT or IMDG proper shipping description: Cord, Detonating, Flexible, 1.1D, UN0065, PG II

May be offered for transportation domestically and transported as Cord, Detonating (UN 0289), Division 1.4 compatibility group D (1.4D) Explosives, if the explosive content does not exceed 100 grains per linear foot (21.3 grams per meter) and the gross weight of all packages of detonating cord does not exceed (45 KG) 99 pounds per vehicle. See 49 CFR 173.63

The maximum recommended temperature for detonating cord is 160°F (71°C). None of the components are listed in the 1987 IARC Monographs, Group 1, 2A or 2B as known, probable, or possible carcinogens, nor are they listed in the NTP annual report on carcinogens.



MATERIAL SAFETY DATA SHEET

HEET

DATE MARCH 2011

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Page 1 of 2

SECTION I

Issued by the Safety and Compliance Dept.

Austin Powder Company
25800 Science Park Drive
Cleveland, Ohio 44122

CHEMTREC (24HR Emergency Telephone), call
1-800-424-9300- United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory).
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887.

For non-emergency assistance, call
216-464-2400

TRADE NAME AND SYNONYMS

HEET 10 SERIES

HEET 100 SERIES

Examples: HEET 30 HEET 50
 HEET 130 HEET 150

SECTION II HAZARDOUS INGREDIENTS

Ammonium Nitrate: NH_4NO_3 ,

CAS No. 6484-52-2

(70 - 90%)

Fuel Oil/Mineral Oil Blend,

CAS No. 68476-30-2

(3 - 9%)

Aluminum: Al,

CAS No. 7429-90-5

(0 - 12%)

A blend of ANFO (ammonium nitrate/fuel oil) and an emulsified mixture of ammonium nitrate solution, fuel oil, mineral oil and polymeric surfactant (emulsifier). May also contain aluminum.

SECTION III PHYSICAL DATA

BOILING POINT, Oil 320°F, 160°C,

VAPOR PRESSURE (mm Hg) 0.4 at 68°F

SPECIFIC GRAVITY ($\text{H}_2\text{O} = 1$) 1.1 to 1.3

VAPOR DENSITY (Air=1) N/A

PERCENT VOLATILE BY VOL. (%) N/A

EVAPORATION RATE: N/A

SOLUBILITY IN WATER: Although in excess of 80% of the materials are readily soluble in water, the products have excellent water resistance.

APPEARANCE AND ODOR: A blend of ANFO (round white to tan granules) and a white to light tan colored thick cream. Slight odor of fuel oil. If aluminum is present, gray metal particles will be visible.

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:

Oils, 125°F Minimum PMCC

FLAMMABLE LIMITS:

Not available

EXTINGUISHING MEDIA:

See below.

SPECIAL FIRE FIGHTING PROCEDURES:

Do not fight fires. Withdraw personnel immediately. Allow fire to burn itself out.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

May explode when subjected to fire or shock, especially when confined and in large quantities.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: Oil mist, mineral, 5 MG/M³, Aluminum metal dust, 10 MG/M³

OSHA: Oil mist, mineral, 5 MG/M³, Aluminum metal dust, 15 MG/M³

EFFECTS OF OVEREXPOSURE: Acute: Ingestion of large amounts may cause cyanosis, nausea, collapse, vomiting, abdominal pain, rapid heartbeat and breathing, coma, convulsions, and death may occur.

EMERGENCY AND FIRST AID PROCEDURES:

Eyes: Slight irritant. Flush with large amounts of water for at least 15 minutes and consult a physician.

Skin: Slight irritant. Wash with mild soap and water.



MATERIAL SAFETY DATA SHEET

HEET

DATE MARCH 2011

MSDS NO. E-2

Page 2 of 2

SECTION VI REACTIVITY DATA

Issued by the Safety and Compliance Dept.

STABILITY: Stable under normal conditions. May explode when subjected to fire or shock, especially when confined and in large quantities.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid all contamination, especially peroxides and chlorates. Alkaline contamination may liberate ammonia fumes.

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous nitrogen oxides and carbon oxides: Toxic decomposition products including carbon monoxide (CO) may migrate to off blast-site areas.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Pick up and dispose of all spilled material immediately. Do not permit smoking or open flames near spill site.

WASTE DISPOSAL METHOD: Uncontaminated material may be placed in large diameter boreholes and detonated so that the explosive energy is utilized as originally intended. Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory): **CALL CHEMTREC** for emergencies only: 1-800-424-9300. **International callers**, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00). **U.S. Maritime callers dial-** 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION: Not required under normal conditions.

VENTILATION: Not required under normal conditions.

PROTECTIVE GLOVES: Slight skin irritant.

EYE PROTECTION: Slight eye irritant.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH THE SAFETY LIBRARY PUBLICATION NO. 4 "WARNINGS AND INSTRUCTIONS" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES.

TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS, BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

DOT or IMDG proper shipping description: Explosive, Blasting, Type E, 1.5D, UN0332, PG II

This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

None of the components are listed in the 1987 IARC Monographs, Group 1, 2A or 2B as known, probable, or possible carcinogens, nor are they listed in the NTP annual report on carcinogens.



Material Safety Data Sheet

Preparation Date: 16-Jun-2004

Revision Date: 15-June-2011

Revision Number: 3

SECTION 1 – PRODUCT AND COMPANY IDENTIFICATION

Supplier(s):

Orica Canada Inc.

Maple Street

Brownsburg, QC

For MSDS Requests: 1-450-533-4201

Orica USA Inc.

33101 E. Quincy Avenue

Watkins, CO 80137-9406

For MSDS Requests: 1-303-268-5000

Product Name:

Ammonium Nitrate Fuel Oil

Product Code:

125

Alternate Name(s):

AMEX™, ANFO

UN-No:

UN0331

Recommended Use:

A booster sensitive blasting agent.

24 EMERGENCY: CANADA:

USA:

1-877-561-3636 (Orica Transportation Emergency Response)

1-800-424-9300 (CHEMTREC)

FOR CHEMICAL EMERGENCIES (24 HOUR) INVOLVING TRANSPORTATION, SPILL, LEAK, RELEASE, FIRE OR ACCIDENTS:

IN CANADA CALL: THE ORICA TRANSPORTATION EMERGENCY RESPONSE SYSTEM AT **1-877-561-3636**.

IN THE U.S. CALL: CHEMTREC 1-800-424-9300. IN THE U.S.: FOR LOST, STOLEN, OR MISPLACED EXPLOSIVES CALL: BATF

1-800-800-3855. FORM ATF F 5400.5 MUST BE COMPLETED AND LOCAL AUTHORITIES (STATE/MUNICIPAL POLICE, ETC.)

MUST BE ADVISED.

SECTION 2 – HAZARD IDENTIFICATION

Emergency Overview:

DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Risk of explosion by shock, fire of other sources of ignition. If misused or disposed of improperly, material could explode and cause death or serious injury. This product contains one or more substances, which are classified in the EU as carcinogenic, mutagenic and/ or reprotoxic. Irritating to eyes, respiratory system and skin. Harmful if swallowed. Oxidizing agent.

Appearance:

Off-white prills

Physical State:

Solid

Odor:

Diesel fuel oil

SECTION 3 – COMPOSITION/ INFORMATION ON INGREDIENTS

Chemical Name

Ammonium Nitrate

Fuels, Diesel, no. 2

CAS-No

6484-52-2

68476-34-6

Weight %

60-82

5-10

SECTION 4 – FIRST AID MEASURES

General Advice:

In case of accident or if you feel unwell, seek medical advice IMMEDIATELY (show the product label where possible).

Eye Contact:

Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Immediate medical attention is required.

Skin Contact:

Wash off immediately with soap and plenty of water, removing all contaminated clothes and shoes. If skin irritation persists, call a physician.

Inhalation:

Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice IMMEDIATELY.

Ingestion:	Immediate medical attention is required. Do not induce vomiting. Clean mouth with water and afterwards drink plenty of water. If spontaneous vomiting occurs, have victim lean forward with head positioned to avoid breathing in of vomitus, rinse mouth and administer more water. Never give anything by mouth to an unconscious person.
Notes to physician:	Symptomatic. Administer oxygen if there are signs of cyanosis. If clinical condition deteriorates, administer 10cc Methylene Blue intravenously. It is unlikely for this to be required with methemoglobin level of less than 40%.

SECTION 5 – FIRE-FIGHTING MEASURES

Flammable properties:	Not itself combustible but assists fire in burning materials. The product does not flash. Rate of burning: will accelerate burning. After fire has started, this product will continue to burn in the absence of air.
Suitable extinguishing media:	DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Evacuate surrounding areas. When controlling fire before involvement of explosives, fire-fighters should wear positive pressure self-containing 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.
Unsuitable extinguishing media:	DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Attempts to smother a fire involving this product will be ineffective as it is its own oxygen source. Smothering this product could lead to decomposition and explosion. This product is more sensitive to detonation if contaminated with organic or oxidisable material or if heated while confined. Unless the mass of product on fire is flooded with water, re-ignition is possible.
Specific hazards arising from the chemical:	This product is a high explosive with mass detonation hazard. DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Immediately evacuate all personnel from the area to a safe distance. Guard against re-entry. 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:	Avoid dust formation. Do not breathe dust.
Methods for cleaning up:	Avoid the use of metal tools containing iron, copper or brass. Be careful to avoid shock, friction, and contact with grit. Collect product for recovery or disposal. For release to land, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Collect contaminated soil and water, and absorbent for proper disposal. Notify applicable government authority if release is reportable or could adversely affect the environment.
Other information:	Deactivating chemicals: Not applicable.

SECTION 7 – HANDLING AND STORAGE

Handling:	This product is an explosive and should only be used under the supervision of trained and licensed personnel. The use of coveralls is recommended. Use good industrial hygiene and housekeeping practices. Keep away from open flames, hot surfaces and sources of ignition.
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, spark 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. Ideal storage temperature is 10-27°C (50-80°F).

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Fuels, Diesel, no. 2	TWA: 100 mg/ m ³ Skin		

Other exposure guidelines:	Ammonium Nitrate: ORICA Guideline 5 mg/m ³ (internal TWA).
Engineering Measures:	No information available.
Personal Protective Equipment	
Eye/Face Protection:	Tightly fitting safety goggles.
Skin Protection:	User should verify impermeability under normal conditions of use prior to general use. Impervious butyl rubber gloves are recommended
Respiratory Protection:	In case of insufficient ventilation wear suitable respiratory equipment. A NIOSH-approved respirator, if required.
Hygiene Measures:	Handle in accordance with good industrial hygiene and safety practice. Recommendations listed in this section indicate the type of equipment, which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Off-white prills	Odor:	Diesel fuel oil
Physical State:	Solid	Viscosity:	No information available
pH:	No data available	Flash Point:	52°C/ 126°F (Diesel fuel)
Autoignition Temperature:	210- 265°C	Boiling Point/Range:	None
Melting Point/Range:	170°C/ 338°F	Flammable Limits (Upper):	Not Applicable
Flammable Limits (Lower):	Not Applicable	Explosion Power:	350-400 kJ/ 100g
Specific Gravity:	No data available	Water Solubility:	Dissolves with prolonged exposure to water
Other Solubility:	Not available	Vapor Pressure:	0.4 mmHg @ 20°C /68°F (diesel fuel oil)
Oxidizing Properties:	Oxidizer	Partition Coefficient (n-octanol/water):	No data available

SECTION 10 – STABILITY AND REACTIVITY

Stability:	Stable under normal conditions. Decomposition Temperature: Ammonium Nitrate will spontaneously decompose at 210°C (410°F).
Conditions to avoid:	Keep away from open flames, hot surfaces and sources of ignition. Not expected to be sensitive to static discharge. Not expected to be sensitive to mechanical impact.
Incompatible materials:	Avoid oxidizable materials, metal powder, bronze & copper alloys, fuels (e.g. lubricants, machine oils), fluorocarbon lubricants, acids, corrosive liquids, chlorate, sulphur, sodium nitrite, charcoal, coke and other finely divided combustibles. Strong oxidizing and reducing agents.
Hazardous decomposition products:	The following toxic decomposition products may be released. At temperatures above 210°C, decomposition may be explosive, especially if confined. Nitrogen oxides (NOx). Carbon monoxide. Hydrocarbons.
Hazardous Polymerization:	None under normal processing. Hazardous polymerization does not occur.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information:	Irritating to eyes. May cause skin irritation. Harmful if swallowed.
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Chemical name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ammonium Nitrate	2217 mg/kg Rat	3000 mg/kg Rabbit	88.8 mg/L Rat 4 h
Fuels, Diesel, no. 2	>5000 mg/kg Rat	>5000 mg/kg Rabbit	

Subchronic Toxicity (28 Days):	Ingestion may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate
---------------------------------------	---

grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia. If ingested, nitrates may be reduced to nitrites by bacteria in the digestive tract. Signs and symptoms of nitrite poisoning include methemoglobinemia, nausea, dizziness, increased heart rate, hypotension, fainting and, possibly shock.

Chronic Toxicity:

May cause methemoglobinemia.

Carcinogenicity:

The table below lists whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Fuels, Diesel, no. 2	A3			

Legend:

A3: Confirmed animal carcinogen.

Mutagenic effects:

There is no evidence of mutagenic potential.

Irritation:

Irritating to eyes. May cause irritation of respiratory tract. May cause skin irritation in susceptible persons.

Reproductive effects:

No information is available and no adverse reproductive effects are anticipated.

Developmental effects:

No information is available and no adverse developmental effects are anticipated.

Target Organ:

Eyes, skin, respiratory system, blood, kidney, liver, urinary tract, blood, endocrine system, immune system & gastrointestinal tract (GI).

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity effects:

Dissolves slowly in water. Harmful to aquatic life at low concentrations.

Environmental Effects:

Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

Mobility in Environmental media:

Some water resistance but soluble with extended time periods.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Burn under supervision of a licensed expert at an explosive burning ground or destroy by detonation in boreholes, in accordance with applicable local, provincial and federal regulations. Call upon the services of an Orica Technical Representative.

SECTION 14 – TRANSPORT INFORMATION

DOT Proper Shipping Name:

Explosive, Blasting, type B

Hazard Class:

1.5D

UN-No:

UN0331

Packing group:

II

TDG Proper Shipping Name:

Explosive, Blasting, type B

Hazard Class:

1.5D

UN-No:

UN0331

Packing group:

II

Transportation Emergency Telephone Number: (CANADA) 1-877-561-3636 or (USA) CHEMTREC: 1-800-424-9300

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, Ammonium Nitrate (6484-52-2) & Fuels, Diesel no.2 (68476-34-6).

SARA 311/312 Hazardous Categorization

Acute Health Hazard:

Yes

Chronic Health Hazard: Yes
Fire Hazard: Yes
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: New Jersey Right-to-Know, Pennsylvania Right-to-Know, Massachusetts Right-to-Know, Rhode Island Right-to-Know, Florida, New Jersey Special Health Hazard Substance List, Minnesota Hazardous Substance List, California Director's List of Hazardous Substances, California Proposition 65.

TSCA: Complies

DSL: Complies

NDSL: Complies

The components in the product are on the following international inventory lists:

Chemical Name	TSCA	DSL	NDSL	ENCS	EINECS	ELINCS	CHINA	KECL	PICCS	AICS
Ammonium Nitrate	X	X	-	-	X	-	X	X	X	X
Fuels, Diesel, no. 2	X	X	-	X	X	-	X	X	X	X

Legend: X – Listed

SECTION 16 – OTHER INFORMATION

Prepared by: Safety Health & Environment
303-268-5000

Preparation Date: 16-Jun-2004
Revision Date: 15-June-2011

The information contained herein is provided only as a guide for the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. This Material Safety Data Sheet is not all-inclusive. The circumstances of use and handling may involve additional considerations that have not been addressed by this Data Sheet. No warranty of any kind is provided or implied by this Data Sheet. Orica will not be liable for any damages, losses, injuries or indirect damages that may result from the use of, or reliance on, any information contained herein.

End of MSDS



MATERIAL SAFETY DATA SHEET

AUSTINITE

DATE MARCH 2011

MSDS NO. B-1

Page 1 of 2

SECTION I Issued by the Safety and Compliance Dept.

Austin Powder Company
25800 Science Park Drive
Cleveland, Ohio 44122

CHEMTREC (24HR Emergency Telephone), call 1-800-424-9300- United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory).
International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).
U.S. Maritime callers dial- 1-703-527-3887.

For non-emergency assistance, call
216-464-2400

TRADE NAME AND SYNONYMS
Ammonium Nitrate-Fuel Oil Mixture, ANFO
Austinite 15
Austinite 30

SECTION II HAZARDOUS INGREDIENTS

Ammonium Nitrate: NH_4NO_3	CAS No. 6484-52-2	(92 to 97%)
Fuel Oil: Combustible Liquid,	CAS No. 68476-30-2	(3 to 8%)

The mixture is classified by DOT as a Blasting Agent Type B or Blasting Explosive, Type B.

SECTION III PHYSICAL DATA

BOILING POINT, 349 ($^{\circ}\text{F}$) 176 ($^{\circ}\text{C}$)	VAPOR PRESSURE (mm Hg) 0.4 @ 68 $^{\circ}\text{F}$
SPECIFIC GRAVITY ($\text{H}_2\text{O} = 1$) 0.85 to 1.10	VAPOR DENSITY (Air = 1) 4.7
PERCENT VOLATILE BY VOL. (%) Approx. 6	EVAPORATION RATE: (Water=1) Slower
SOLUBILITY IN WATER: NH_4NO_3 118.3 g/100cc @ 0 $^{\circ}\text{C}$	
APPEARANCE AND ODOR: Granular beige-white, pink or orange (Canada), material with hydrocarbon (fuel oil) odor.	

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:	Fuel Oil 125 $^{\circ}\text{F}$ Minimum P.M.
FLAMMABLE LIMITS:	Fuel Oil Lower 0.7% Upper 5.0%
EXTINGUISHING MEDIA:	See below.
SPECIAL FIRE FIGHTING PROCEDURES:	Do not fight fires. Withdraw personnel immediately. Allow fire to burn itself out. Avoid toxic fumes from fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to fire or shock, especially when confined and in large quantities.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: Ammonium Nitrate - None Oil mist, mineral, 5 MG/M³
OSHA : Ammonium Nitrate - None Oil mist, mineral, 5 MG/M³
EFFECTS OF OVEREXPOSURE: Acute: Ingestion of large amounts may cause cyanosis, nausea, collapse, vomiting, abdominal pain, rapid heartbeat, rapid breathing, coma, convulsions, and death may occur.

EMERGENCY AND FIRST AID PROCEDURES:

Eyes:	Slight irritant.	Flush with large amounts of water.
Skin:	Slight irritant.	Wash with mild soap and water.



MATERIAL SAFETY DATA SHEET

AUSTINITE

DATE MARCH 2011

MSDS NO. B-1

Page 2 of 2

SECTION VI REACTIVITY DATA

Issued by the Safety and Compliance Dept.

STABILITY: Stable under normal conditions. May explode when subjected to fire or shock, especially when confined and in large quantities.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid all contamination, especially peroxides and chlorates. Alkaline contamination may liberate ammonia fumes.

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous nitrogen oxides and carbon oxides: Toxic decomposition products including carbon monoxide (CO) may migrate to off blast-site areas.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep up and dispose of all spilled material immediately. Do not permit smoking or open flames near spill site.

WASTE DISPOSAL METHOD: Uncontaminated material may be placed in large diameter boreholes and detonated so that the energy is utilized as originally intended. This material may become a hazardous waste under certain conditions. Call Austin Powder for recommendations and assistance. It must be collected, labeled and disposed of under direct supervision of a qualified person according to local, state and federal regulations.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States, Canada, Puerto Rico (U.S. Commonwealth) and the Virgin Islands (U.S. Territory): **CALL CHEMTREC** for emergencies only: 1-800-424-9300.

International callers, dial the U.S. access number followed by 1-703-527-3887 (Mexico access number 00).

U.S. Maritime callers dial- 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION: Not required under normal conditions.

VENTILATION: Not required under normal conditions.

PROTECTIVE GLOVES: Not required for normal conditions. Slight skin irritant.

EYE PROTECTION: Not required under normal conditions. Slight eye irritant.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH THE SAFETY LIBRARY PUBLICATION NO. 4 "WARNINGS AND INSTRUCTIONS" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES.

TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS, BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

DOT proper shipping description for Domestic transportation: Ammonium Nitrate-Fuel Oil Mixture, 1.5D, NA0331, PG II.

DOT or IMDG proper shipping description for Domestic or International transportation: Explosive, Blasting, Type B or Agent, Blasting, Type B, 1.5D, UN0331, PG II. Exemption DOT-E11156 authorizes shipment of multi-wall, stitch top closure, water-resistant bags.

This product should be kept dry and the oldest material used first. Use only proper primers. Avoid wet holes and inadequate confinement. If these restrictions are observed, the formation of toxic fumes from detonation will be minimized.

None of the components are listed in the 1987 IARC Monographs, Group 1, 2A or 2B as known, probable, or possible carcinogens, nor are they listed in the NTP annual report on carcinogens.

