
Blasting Plan

for

Stetson Wind Tower

, Danforth, Maine

Date: September 26, 2007

Prepared By: Maine Drilling & Blasting, Inc

Eastern Division

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Blasting Personnel

All blasting operations shall be conducted by experienced, trained and competent persons who understand the hazards involved. Persons working with explosive materials shall:

1. Have demonstrated a knowledge of, and a willingness to comply with, safety and security requirements.
2. Be capable of using mature judgment in all situations.
3. Be of good physical condition and not addicted to intoxicants, narcotics, or other similar type of drugs.
4. The person(s) responsible for the explosives shall possess current knowledge of the local, State and Federal laws and regulations applicable to his work.
5. The person(s) responsible for the explosives shall have obtained a Certificate of Competency or a license as required by State law.

Licenses and Permits

Maine Drilling & Blasting, Inc is fully licensed and insured for the transportation, use, and handling of explosives. Evidence of insurance is available. Blasting permits will be applied for as required from the local authorities by the Maine Drilling & Blasting, Inc Blaster/Foreman when blasting is about to begin.

Blast Vibration

Blast vibration will be monitored at the blast site, typically at the structure(s) closest to the blast site. Vibration limits will closely follow limits described in the project specifications and the State Regulations. Blast designs will be modified as required to stay within the guidelines and meet project schedules as well. Blasting operations will be modified accordingly when approaching buildings and utilities. Enclosed are preliminary vibration calculations based on known distances to the structures of concern and anticipated initial blast designs.

Ground vibration peak particle velocity limits shall not exceed:

- * Up to 30 Hertz: 0.5 inches per second
- * Thirty-one to 40 hertz: 1.0 inches per second
- * More than 40 Hertz: 2.0 inches per second

Airblast overpressure level not to exceed 133 peak dB (linear) two Hertz high -pass system.

Blast Reports

Enclosed is a sample of a Maine Drilling & Blasting, Inc Blast Report. This report will be filled out for each blast and copies supplied as needed.

Typical Blast Design

Enclosed are what would be considered typical blast designs for this project. Hole sizes, depths, spacing and loading information is provided. These designs are to be considered a good starting point. Modifications are usually made, if necessary, following the first blasts to meet control and seismic considerations.

8. Blasting mats shall be used as necessary to cover blasts.

9. The Blasting Contractor shall insure that extra safety and judgment is exercised by his blaster to prevent the simultaneous blasting of numerous holes.

Blasting Mats

Blasting mats and backfill will be used to control excessive amounts of rock movement when blasting in close proximity to structures. Placement and number of mats are typically determined by the blaster. Mats will be placed so as to protect all people and structures on, or surrounding the blast site and property. Rubber tire type blasting mats will be utilized on this project and will be approximately 12' x 12' in size; Rubber mat @ 12' x 12' 38 lbs./s.f. = 5,472 lbs./ea.

Blast Security and Warning Whistles

Each blast will be preceded by a security check of the affected area and then a series of warning whistles. Communications will be made with job site supervisors and local officials as required to ensure the safest possible operation. All personnel in the vicinity closest to the blast area will be warned. The warning whistles will follow the following sequence:

3 Whistles - 5 Minutes to Blast

2 Whistles - 1 Minute to Blast

1 Whistle - All Clear

The blast site will be examined by the blaster prior to the all clear signal to determine that it is safe to resume work. No blast will be fired until the area has been secured and determined safe.

Explosives

All explosives will be delivered to the job site on a daily basis. There will be no overnight storage. Only the amount of explosives required to perform the day's work will be brought to the site. All explosives will be stored in approved magazines when not in use.

Enclosed are Technical Data and MSDS sheets for the explosive products proposed for use on this project. Any one of, or a combination of these products may be in use at any one time on the site.

Blaster Qualifications

All Maine Drilling & Blasting, Inc blasters on this job will be licensed in the State of Maine and have received various amounts of training in the safe use and handling of explosives. Additionally, Maine Drilling & Blasting, Inc blasters are familiar with all OSHA Regulations, State Regulations, and Federal Regulations regarding construction site safety, including transportation, use, and handling of explosive materials. Weekly safety meetings are to be held on site by the Maine Drilling & Blasting, Inc job foreman, with a record of that meeting returned to the Maine Drilling & Blasting, Inc office.

General

Maine Drilling & Blasting, Inc considers safety as the priority during all phases of blasting operations. We are knowledgeable of and will follow all local, state and federal regulations related to transportation and use of explosives. The project specifications and conditions have been reviewed. Details of procedures for pre-blast surveys, explosives use, blast security, monitoring and documentation are enclosed.

Pre-Blast Surveys / Notifications

Pre-blast surveys will be offered to all property owners within 500 foot radius of the blast site. Appropriate notices will be given and appointments arranged for those owners who desire a survey. Pre-blast surveys will be conducted by a Company Representative. Results of those surveys will be documented through video or still photographs and appropriate narration or written reports.

Blast Monitoring

All blasts will be monitored by a representative of Maine Drilling & Blasting, Inc who has been properly trained in the setup and use of seismic monitoring equipment. At least one seismograph will be in use at all times. Placement of monitoring equipment will be at the nearest structure to the blast site. Maine Drilling & Blasting, Inc monitoring equipment will consist of Instantel type seismographs. Details are enclosed. Results of blast monitoring will typically be available before the next blast, usually immediately following a blast. Results can be reviewed and modifications can be made to the blast design for the next blast if necessary.

Sequence of Blasting

All blasting operations will be strictly coordinated with Sargent Corporation , engineers, and Danforth Fire Department. Emphasis will be on the safe and efficient removal of the rock existing on this project without impact to surrounding structures. Blasts will be developed so as to create adequate relief which will minimize ground vibrations and offer the greatest protection possible to the surrounding structures.

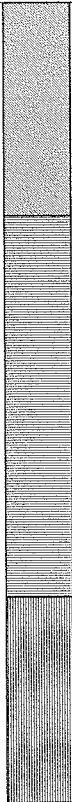
Blasting Procedures

1. Blasting operations shall commence after 6:00 AM and cease before 6:00 PM, Monday through Saturday.
2. Blasting cannot be conducted at times different from those announced in the blasting schedule except in emergency situations, such as electrical storms or public safety required unscheduled detonation.
3. Warning and all-clear signals of different character that are audible within a range of one-half mile from the point of the blast shall be given. All persons within the permit area shall be notified of the meaning of the signals through appropriate instructions and signs posted.
4. Access to blasting area shall be regulated to protect the public from the effects of blasting. Access to the blasting area shall be controlled to prevent unauthorized entry before each blast and until the perimeter's authorized representative has determined that no unusual circumstances exist after the blast. Access to and travel in or through the area can then safely resume.
5. Areas in which charged holes are awaiting firing shall be guarded, barricaded and posted, or flagged against unauthorized entry.
6. All blasts shall be made in the direction of the stress relieved face previously marked out or previously blasted.
7. All stemming shall be minimum as specified using clean, dry 3/8" crushed stone.

- Blast Design Plan -

Description: OpenRock
Road and Tower Blasting

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>35</u>			
Depth	<u>15'</u>		Stemming:	4.0' Stemming Stone
Hole Diameter	<u>4.0"</u>			
Burden	<u>7'</u>			
Spacing	<u>8'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>42.56 lbs</u>			
Pounds per Hole	<u>42.56 lbs</u>		Dry Load:	7.2' gdPellite WR
Total Est. Pounds	<u>1489.60 lbs</u>			
Powder Factor	<u>1.71 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	3.9' gdBA Chub 2.5"-3"x	

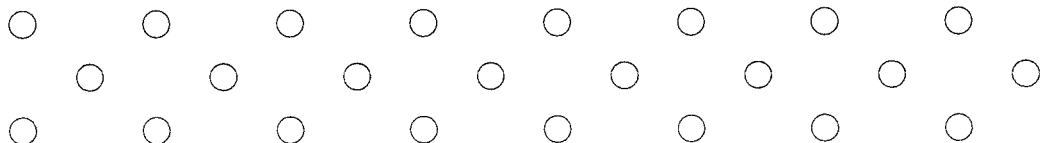
Blast Plan Notes
Seismograph at closest location

Vibration Predication (formula based on Dupont Handbook)

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>900</u>	Distance to Structure
lbs per Delay (w)	<u>42.56</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>137.96</u>	(sd = d / square root of w)
Esimated PPV	<u>0.06</u>	(ppv = k * sd ^ - 1.6)

Typical for production work consistent holes 15' deep at 900' from a structure utilizing 4.0" diameter at a 7' by 8' pattern.

Plan View/Timing Design (please see attached timing diagrams)



Calibration Certificate

Part Number: 712A0101

Description: DS477 BM II MIC 2-250Hz

Serial Number: 2239

Calibration Date: July 17, 2007

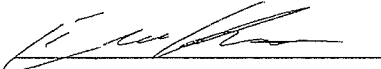
Calibration Equipment: 714J7401

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is certified to the ISO9001:2000 quality standard, and are designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology, or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: 

Eric Roux

 **Instantel**

BLASTING ON THIS SITE IS UNDER
THE CONTROL OF

**Maine Drilling
& Blasting**

All employees & visitors of this site are to follow the instructions of Maine Drilling & Blasting personnel concerning blast area access and evacuation.

**NOTICE OF BLAST
IS GIVEN BY THE FOLLOWING SIGNALS:**

3 Whistles - 5 minutes to BLAST

2 Whistles - 1 minute to BLAST

1 Whistle - ALL CLEAR

In the event of an emergency contact:

- 1) Local Fire and Rescue Department
- 2) Site Owner/Operator
- 3) Safety Engineer Maine Drilling & Blasting:

APPENDIX B.-ALTERNATIVE BLASTING LEVEL CRITERIA

Safe blasting vibration criteria were developed for residential structures, having two frequency ranges and a sharp discontinuity at 40 Hz (table 13). There are blasts that represent an intermediate frequency case, being higher than the structure resonance (4 to 12 Hz) and lower than 40 Hz. The criteria of table 13 apply equally to a 35-Hz and a 10-Hz ground vibration, although the responses and damage potentials are very much different.

Using both the measured structure amplifications (fig. 39) and damage summaries (figs. 52 and 54), a smoother set of criteria was developed. These criteria have more severe measuring requirements, involving both displacement and velocity (fig. B-1).

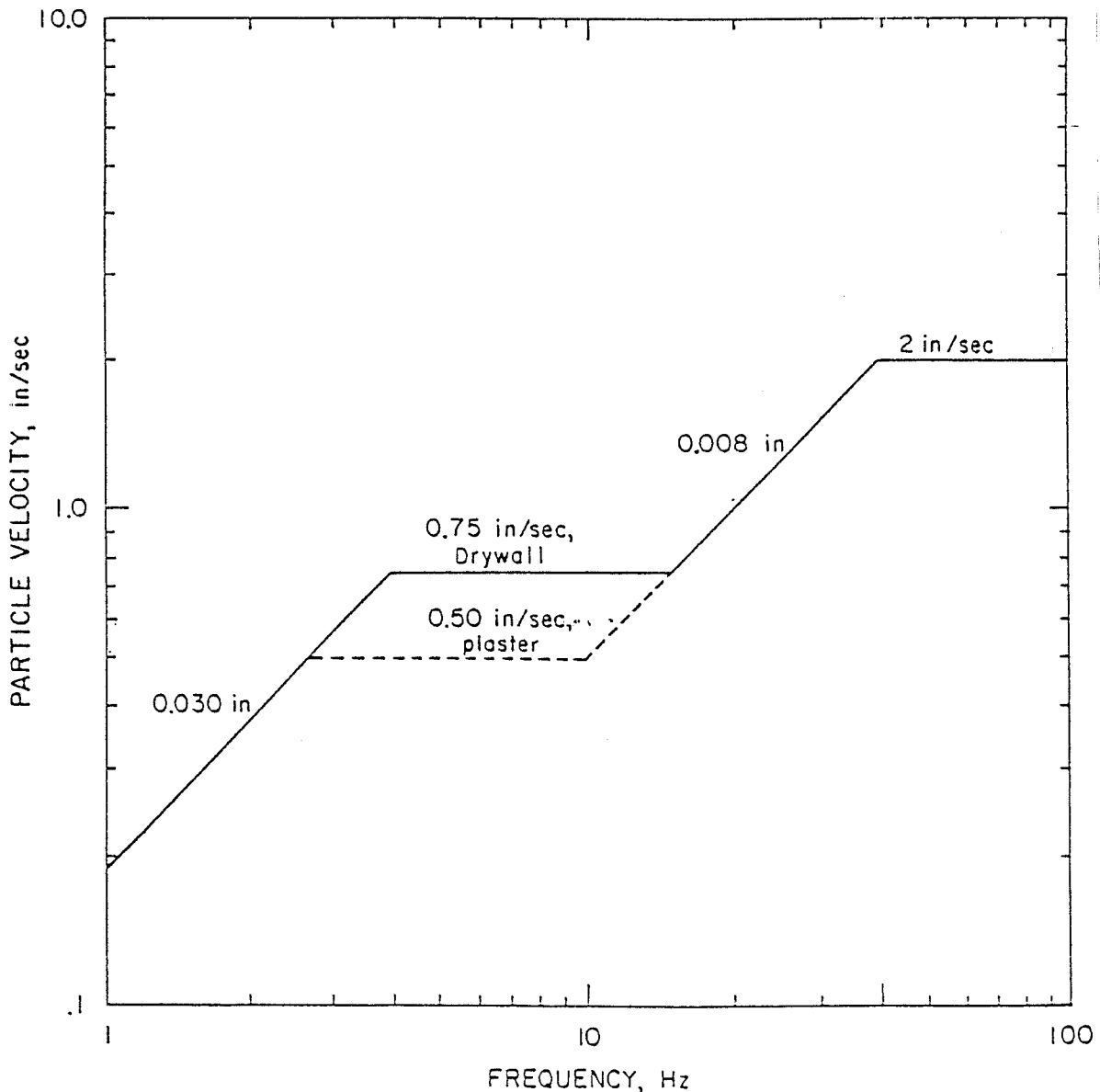


Figure B-1.—Safe levels of blasting vibration for houses using a combination of velocity and displacement.

Material Safety Data Sheet

Dyno Nobel Inc.
2650 Decker Lake Boulevard, Suite 300
Salt Lake City, Utah 84119
Phone: 801-364-4800 Fax: 801-321-6703
E-Mail: dnna.hse@am.dynonobel.com
FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666

MSDS # 1019
Date 03/27/07

Supersedes
MSDS # 1019 01/24/05

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s):	D-GEL™ 1000 DYNOSPLIT®: D1, D 3/4, D 7/8 EXTRA GELATIN: 40%, 75% GELAPRIME® F UNIGEL® UNIMAX® VIBROGEL®: 1,3 Z POWDER™ DYNOMAX PRO™	Oil Well Explosive 80% Oil Well Explosive 100% STONECUTTER™ REDH® A RED H® B POWERGEL D 60% Hi-Pressure Gelatin IRESPLIT® D IP: 724, 738
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Product Class: Dynamites and Blasting Gelatins

Product Appearance & Odor: Powdery to gelatinous solid, light tan to dark brown color. Faint, waxy odor.

DOT Hazard Shipping Description: Explosive, blasting, type A 1.1D UN0081 II

NFPA Hazard Classification: Not Available (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

<u>Ingredients:</u>	<u>CAS#</u>	<u>% (Range)</u>	<u>Occupational Exposure Limits</u>	
			<u>ACGIH TLV-TWA</u>	<u>OSHA PEL-TWA</u>
Nitroglycerin (NG)	55-63-0	1-20	0.05 ppm	0.05 ppm
Ethylene Glycol Dinitrate (EGDN)	628-96-6	8-76	0.05 ppm	0.05 ppm
Nitrocellulose	9004-70-0	0-6	None	None
Ammonium Nitrate	6484-52-2	0-75	None	None
Sodium Nitrate	7631-99-4	0-50	None	None
Sulfur ¹	7704-34-9	0-4	None	None

¹ This ingredient is not found in most of the products listed above.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in de minimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable

Vapor Density: Not Applicable

Percent Volatile by Volume: Not Applicable

Evaporation Rate (Butyl Acetate = 1): Not Applicable

Vapor Pressure: Not Applicable

Density: 0.8-1.48 g/cc

Solubility in Water: Ammonium and sodium nitrates are completely soluble. NG and EGDN are very slightly soluble.

Material Safety Data Sheet

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable

Flammable Limits: Not Applicable

Extinguishing Media: (See Special Fire Fighting Procedures section.)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

Eyes: May cause irritation, redness and tearing.

Skin: Contact may result in headache, nausea and blood vessel dilation.

Ingestion: May result in headache, nausea, intestinal upset and blood vessel dilation.

Inhalation: May result in headache, nausea and blood vessel dilation.

Systemic or Other Effects: None known.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Remove contaminated clothing. Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: Remove to fresh air. If irritation persists, seek medical attention.

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions. May explode when subjected to fire, supersonic shock, or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, ignition sources and strong shock.

Materials to Avoid (Incompatibility): Corrosives (mineral acids, bases, strong acids).

Hazardous Decomposition Products: Carbon Monoxide (CO), Hydrogen Sulfide (H₂S), Nitrous Oxides (NO_x), and Sulfur Oxides (SO_x).

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State, and local spill reporting requirements. Contact of this product with water may result in a reportable release.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

Material Safety Data Sheet

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Forced ventilation may be necessary where natural ventilation is limited. Magazines containing NG and/or EGDN based explosives must be ventilated before entry.

Respiratory Protection: None normally required.

Protective Clothing: Chemical resistant (nitrile) gloves are suggested.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: Inhalation and skin contact should be minimized to avoid headaches, nausea, and blood vessel dilation. Protective clothing should be changed daily, more often if contaminated.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State, and local regulations. Keep away from heat, flame, ignition sources, and strong shock.

Precautions to be taken during use: Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

Other Precautions: It is recommended that users of explosive materials be familiar with the Institute of Makers of Explosives Safety Library Publications.

SECTION X - SPECIAL INFORMATION

Chemical Name

Nitroglycerin

CAS Number

55-63-0

% By Weight

1-20

The reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 may become applicable if the physical state of this product is changed to an aqueous solution. If an aqueous solution of this product is manufactured, processed, or otherwise used, the nitrate compounds category and ammonia listing of the previously referenced regulation should be reviewed.

Disclaimer

Dyno Nobel Inc. and its subsidiaries disclaim any warranties with respect to this product, the safety or suitability thereof, the information contained herein, or the results to be obtained, whether express or implied, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND/OR OTHER WARRANTY. The information contained herein is provided for reference purposes only and is intended only for persons having relevant technical skills. Because conditions and manner of use are outside of our control, the user is responsible for determining the conditions of safe use of the product. Buyers and users assume all risk, responsibility and liability whatsoever from any and all injuries (including death), losses, or damages to persons or property arising from the use of this product or information. Under no circumstances shall either Dyno Nobel Inc. or any of its subsidiaries be liable for special, consequential or incidental damages or for anticipated loss of profits.



MATERIAL SAFETY DATA SHEET

HYDROMITE EMULSIONS

DATE JUNE 2004

MSDS NO. E-4

Page 1 of 2

SECTION I		Issued by the Safety and Compliance Dept.	
AUSTIN POWDER COMPANY 25800 SCIENCE PARK DRIVE CLEVELAND, OHIO 44122 EMERGENCY PHONE DAY 216-464-2400 NIGHT 216-464-2407		TRADE NAME AND SYNONYMS Hydromite 600 Series Hydromite 800 Series Hydromite 1000 Series Hydromite 2000 Series Hydromite 3000 Series Hydromite 4000 Series	
SECTION II HAZARDOUS INGREDIENTS			
Ammonium Nitrate: NH_4NO_3 ,	CAS No. 6484-52-2	(65 - 90%)	
Fuel Oil/ Mineral Oil Blend,	CAS No. 68476-30-2	(3 - 9%)	
Aluminum: Al,	CAS No. 7429-90-5,	(0 - 10%)	
Polymeric Surfactant	Not Applicable for Mixtures	(0.5 - 2%)	
An emulsified mixture of ammonium nitrate solution, fuel oil, mineral oil and polymeric surfactant (emulsifier). May also contain ammonium nitrate prills (granules) and/or aluminum.			
SECTION III PHYSICAL DATA			
BOILING POINT:	N/A	VAPOR PRESSURE (mm Hg)	N/A
SPECIFIC GRAVITY ($\text{H}_2\text{O} = 1$):	1.20 to 1.30	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: White to tan colored thick cream. If aluminum is present, gray metal particles will be visible. If ammonium nitrate prill is present, white to tan colored granules will be visible. Slight odor of fuel oil.			
SECTION IV FIRE AND EXPLOSION DATA			
FLASH POINT:	165 ^o F (74 ^o C) (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/M ³ , Aluminum metal dust, 10 MG/M ³ OSHA: Oil mist, mineral, 5 MG/M ³ , Aluminum metal dust, 15 MG/M ³		
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

HYDROMITE EMULSIONS

DATE JUNE 2004

MSDS NO. E-4

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. Avoid temperatures above 212°F, (100°C).

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:

CALL CHEMTREC for emergencies only: 1-800-424-9300. For calls originating outside the U. S. dial the U. S. access number followed by: 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

SHOCK★STAR™ SHOCK TUBING

DATE MAY 2004

MSDS NO. C-3

PAGE 1 OF 2

SECTION I		Issued by the Safety and Compliance Dept.	
AUSTIN STAR DETONATOR COMPANY 901 CANTU ROAD BROWNSVILLE, TX 78520 24 HOUR PHONE: 956-831-7751		TRADE NAME AND SYNONYMS Signal Transmission Tubing Shock Tube LEAD-IN-LINE (L-I-L)	
SECTION II HAZARDOUS INGREDIENTS			
The explosive components of this device (HMX and Aluminum Powder) are less than 0.4 percent by weight of the shock tube and are totally enclosed in the tubing.			
SECTION III PHYSICAL DATA			
BOILING POINT	N/A	VAPOR PRESSURE (mm Hg)	N/A
SPECIFIC GRAVITY (H ₂ O = 1)	N/A	VAPOR DENSITY (Air = 1)	N/A
PERCENT VOLATILE BY VOL. (%)	None	EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	Negligible		
APPEARANCE AND ODOR: Flexible ionomer resin plastic tubing with a minute amount of an extremely fine, silver colored explosive composition on the interior walls of the tube. No odor.			
SECTION IV FIRE AND EXPLOSION DATA			
FLASH POINT:	N/A		
FLAMMABLE LIMITS:	N/A		
EXTINGUISHING MEDIA:	Water, CO ₂ , foam, dry chemical fire extinguisher.		
SPECIAL FIREFIGHTING PROCEDURES:	Not determined.		
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Avoid toxic fumes from fire.		
SECTION V HEALTH HAZARD DATA			
THRESHOLD LIMIT VALUE:	Not determined.		
EFFECTS OF OVEREXPOSURE:	Not determined.		
EMERGENCY AND FIRST AID PROCEDURES:			
FUMES:	Remove to fresh air.		



MATERIAL SAFETY DATA SHEET

Austin Star Detonator Company
901 Cantu Road
Brownsville, TX 78520

SHOCK★STAR™ SHOCK TUBING

DATE MAY 2004

MSDS NO. C-3

PAGE 2 OF 2

SECTION VI REACTIVITY DATA

Issued by the Safety and Compliance Dept.

STABILITY: Stable.

INCOMPATIBILITY (MATERIALS TO AVOID): None known.

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 containers or units by hand.

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.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States:

CALL CHEMTREC for emergencies only: 1-800-424-9300. For calls originating outside the U.S. dial the U.S. access number followed by: 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.

EYE PROTECTION: Not required.

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.

Avoid any situation that may cause entanglement with machinery or moving equipment. Jerking and breaking Shock Tubing may lead to a premature detonation known as "Snap and Shoot". Do not drive equipment over Shock Tubing.
DOT or IMDG proper shipping description:

1) Standard packaging: Articles, Explosive, n.o.s., (contains HMX/Aluminum), 1.4S, UN0349, PGII.

2) Not regulated as an explosive when packaged on production or large volume shipping spools with end caps. May be shipped as: Plastic Tubing.

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

SHOCK *STAR NON-ELECTRIC DETONATORS

DATE MAY 2006

MSDS NO. ED-5 PAGE 1 of 2

SECTION I		Issued by the Safety and Compliance Dept.	
AUSTIN STAR DETONATOR COMPANY 901 CANTU ROAD BROWNSVILLE, TX 78520 24 HOUR PHONE; 956-831-7751		TRADE NAME AND SYNONYMS Shock*Star: Twin* Star Detonators, In-Hole Delays, Detonators, Surface Delay Connectors, Quick-Relay Connectors, Dual-Delays, Shorty, Long Period, STD (Shock Tube with Detonators) and MS Connector. Non-Electric Blasting Caps	
SECTION II HAZARDOUS INGREDIENTS			
Explosive components are PETN and lead compounds sealed in a metal shell.			
PETN, Pentaerythritol tetranitrate, C ₅ H ₈ N ₄ O ₁₂		CAS No. 78-11-5	
Lead Azide, Pb (N ₃) ₂		CAS No. 13424-46-9	
Lead Styphnate, Lead Trinitroresorcinate, C ₆ H ₃ N ₃ O ₉ Pb		CAS No. 15245-44-0	
SECTION III PHYSICAL DATA			
BOILING POINT	N/A	VAPOR PRESSURE (mm Hg)	N/A
SPECIFIC GRAVITY (H ₂ O = 1)	N/A	VAPOR DENSITY (Air = 1)	N/A
PERCENT VOLATILE BY VOL. (%)	N/A	EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	Insoluble		
APPEARANCE AND ODOR: Aluminum or copper shells with Shock Tube attached. See the Shock Tube MSDS. 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 flame, heat, impact or friction. Safe from extraneous electric currents except for high energy discharges such as lightning. Do not exceed 150°F (66°C). Avoid toxic fumes from fire.		
SECTION V HEALTH HAZARD DATA			
THRESHOLD LIMIT VALUE: ACGIH: 0.05 mg/M ³ TWA, lead, elemental, and inorganic compounds, as Pb. OSHA : 50 µg/M ³ PEL as Pb. For additional information, see 29 CFR 1910.1025			
EFFECTS OF OVEREXPOSURE: None likely when safe blasting practices are employed.			
EMERGENCY AND FIRST AID PROCEDURES: Improper handling or misuse may cause detonation resulting in injuries from shrapnel. Lead and lead compounds are listed in the 1987 IARC Monographs as possible human carcinogens (Group 2B). Lead is not listed in the NTP annual report on carcinogens.			



MATERIAL SAFETY DATA SHEET

SHOCK*STAR NON ELECTRIC DETONATORS

Austin Star Detonator Company
901 Cantu Road
Brownsville, TX 78520

DATE MAY 2006

MSDS NO. ED-5

PAGE 2 OF 2

SECTION VI REACTIVITY DATA **Issued by the Safety and Compliance Dept.**

STABILITY: May explode when subjected to flame, heat, impact or friction. Shock*Star and non-electric detonators are safe from extraneous electric currents except for high energy discharges such as lightning.

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

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide and lead fumes.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Pick up containers or units by hand. Avoid conditions affecting stability. DO NOT use damaged detonators.

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: **CALL CHEMTREC** for emergencies only: 1-800-424-9300. For calls originating outside the U. S. dial the U. S. access number followed by: 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION: Avoid breathing fumes from detonation.

VENTILATION: Not required.

PROTECTIVE GLOVES: Not required.

EYE PROTECTION: Not required.

SECTION IX SPECIAL PRECAUTIONS

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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.

THESE DETONATORS MAY BE SHIPPED UNDER ONE OF THE FOLLOWING DOT CLASSIFICATIONS:

DOT or IMDG proper shipping description:

Detonator Assemblies, Non-Electric, 1.1B, UN0360, PGII Detonator Assemblies, Non-Electric, 1.4B, UN0361, PGII

Consult IME Safety Library Publication No. 22, RECOMMENDATIONS FOR THE SAFE TRANSPORTATION OF DETONATORS IN A VEHICLE WITH CERTAIN OTHER EXPLOSIVE MATERIALS AND THE GUIDE FOR THE USE OF THE IME 22 CONTAINER.



Maine Drilling & Blasting

EMERGENCY PROCEDURES

All employees are to follow company emergency policies and procedures for personal injury/property damage in the event of an accident or incident involving hazardous materials.

SPILL CLEAN-UP PROCEDURES-

- Identify the type of material spilled.
- Take immediate action to contain the spill, stop the flow or discharge, etc.
- Contact the Corporate Office and provide information on location, type, amount of spill and all emergency actions taken to contain the spill.
- Stay with the spill until it is completely cleaned-up or have been relieved by a company officer/manager.
- Take pictures if possible.
- Record all events occurring before, during and after the spill including DEP contact if required.

DEP CONTACT PROCEDURES-

DEP EMERGENCY #'S

MAINE	AUGUSTA	800-452-1942
VERMONT	MONTPELIER	800-641-5005
MASSACHUSETTS	BOSTON	617-556-1133 888-304-1133
NEW HAMPSHIRE	CONCORD	603-271-3503
RHODE ISLAND	PROVIDENCE	401-222-3070
CONNECTICUT	HARTFORD	860-424-3338
NEW YORK	ALBANY	518-457-7362

The Blaster/Foreman must contact DEP directly whenever there is a delay in contacting the Corporate Officer. When direct contact with DEP is required:

- Provide information on location, type, and amount of spill.
- Identify the Safety Specialist and provide telephone number for him to the DEP.
- Stay with the spill until it is completely cleaned up or have been relieved by a

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New Hampshire 603 647-0299
Vermont/New York 802 479-3341

company officer/manager.

- Cooperate with DEP Personnel and other official responders. Provide appropriate information to help minimize any health or environmental exposures.

VIOLATIONS-

Violations of this policy will be subject to disciplinary action per company Compliance Policies.



Maine Drilling & Blasting

EMERGENCY PROCEDURES – PERSONAL INJURY/PROPERTY DAMAGE

All employees are to follow company policies and procedures for handling of emergencies in the event of an accident or incident involving hazardous materials.

PROCEDURES:

When handling or working with hazardous materials these procedures will be followed at all times:

Gas/Arc Welders:

- Fire extinguishers will be available on all operations.
- All cylinders or bottles will be handled in accordance with OSHA and AHSL standards.
- Cylinders
 - Transported in vertical position
 - Secured or chained to prevent tipping
 - Caps installed when not in use
 - O will not be stored with any other gas including inert gases. O requires 20' distance from other gases in storage or non-combustible barrier separating them. (I.e. transit, asbestos, board, metal or 5/8" minimum wall board).
- Frames of all Arc welding/cutting machines shall be grounded.
- All cables shall be completely insulated and flexible – capable of handling maximum current requirements.
- Flash shields will be used whenever possible.
- Eye protection will be used by welder/cutter and helper.

Explosives:

- Fire extinguishers will be available on all operations.
- No smoking, matches, flames or spark – producing devices or firearms within 50' of any explosives or flammable material.
- Do not throw or drop explosives.
- Keep types and sizes together.
- Store cases flat, topside up, code date out.
- Stack to avoid possibility of collapse.
- Keep boxes closed.
- Store only explosive materials (no tools, tires, etc.).

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- Store detonators separately.
- Remove oldest stock first.

VIOLATIONS:

Violation of any of the above could result in disciplinary action per company Noncompliance Policy.



Maine Drilling & Blasting

HAZARDOUS MATERIALS POLICY

A Hazardous Materials Policy has been developed to assist the Company in its efforts to eliminate or reduce personal injury and property loss and to demonstrate public responsibilities.

To assure compliance with regulatory and statutory requirements, each office will be provided with a copy of:

- Federal Motor Carrier Safety Regulations Pocketbook.
- NFPA #495 Code for the Manufacturer, Transportation and Use of Explosive Material.
- Copies of State Regulations.
- OSHA Manual
- MSDS Manual

The Company Hazardous Materials Policy includes procedures for:

- Gas Welding
- Arc Welding
- Explosives Handling
- Emergency Procedures

The Hazardous Materials Policy is subject to all Company safety and emergency policies and procedures.

The Hazardous Materials Policy requires that:

- Hazardous materials data lists be available at all job sites and offices. This list is to contain the types of hazardous materials being used, the product manufacturer and an emergency # for the product manufacturer.
- Any accident involving hazardous materials that occurs, must be recorded and reported.
- All employees handling hazardous materials be trained in the proper handling of hazardous materials.
- All hazardous materials be clearly marked and rated according to the National Fire Protection Association and regulatory authorities.
- All job site employee be trained in Company hazardous materials procedures and are to follow Company emergency policies in the even of an accident/incident.

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COMPANY RESPONSIBILITIES

The Company will provide for:

- Education and training of all employees in procedures pertinent to hazardous materials.
- Hazardous materials data lists for posting at all job sites.
- All necessary forms for purposes of documentation and compliance with reporting requirements.
- Telephone #'s and locations of manufacturers and emergency medical care providers.

EMPLOYEE RESPONSIBILITIES

Division Managers and Safety Engineers are responsible for training employees in hazardous materials procedures.

Safety Engineers, Supervisors and Blaster Foremen are responsible for providing:

- All job site personnel with the job site location of the hazardous materials data list
- All job site personnel with directions to established health care providers and the nearest emergency health care provider.

Supervisors and Blaster Foremen are responsible for completing an investigation and submitting a Loss Control Report for any incident/accident involving hazardous materials.

All employees required by statute must:

- Participate in hazardous materials training sessions.
- Stay current on regulatory requirements involving hazardous materials.
- Request assistance from Safety Engineers if they are unsure of standards, regulations, etc. of hazardous materials.



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