SECTION 1 – IDENTIFICATION

Name, Address, and Telephone of the Responsible Party
Dyno Nobel Inc.
2795 East Cottonwood Parkway, Suite 500
Salt Lake City, Utah 84121
Phone: 801-364-4800   Fax 801-321-6703
E-Mail: dna.hse@am.dynonobel.com  www.dynonobel.com

Product Identifier
Product Form: Mixture
Product Name: Bulk Emulsion Explosive

Other Means of Identification
Synonyms:
- DYNO® RU
- DYNO® RU Alaska
- DYNO® RU SX
- DYNO® RU Uphole
- EXTRAMITE 2000
- FRAGMITE
- TITAN® 1000 LD-E2
- TITAN® 1000 LD
- TITAN® 1000 LD GREEN
- TITAN® 1000 SD
- TITAN® 1000 SD GREEN
- TITAN® PB 1000 LD
- TITAN® PB 1000 SD

Intended Use of the Product
Industrial applications

Emergency Telephone Number
FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666

SECTION 2 – HAZARD(S) IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)
- Expl. 1.5  H205
- Acute Tox. 4 (Oral)  H302
- Skin Irrit. 2  H315
- Eye Irrit. 2B  H320
- Carc. 2  H351
- STOT RE 2  H373
- Asp. Tox. 1  H304

Label Elements
GHS-US Labeling
Hazard Pictograms (GHS-US)

Signal Word (GHS-US) : Danger
Hazard Statements (GHS-US) : H205 - May mass explode in fire
H302 - Harmful if swallowed
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H320 - Causes eye irritation
H351 - Suspected of causing cancer
H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary Statements (GHS-US):
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking
P220 - Keep/Store away from clothing, combustible materials, combustibles
P221 - Take any precaution to avoid mixing with combustible materials, clothing, combustibles
P233 - Keep container tightly closed
P260 - Do not breathe dust, fume, mist, spray, vapors
P264 - Wash exposed areas thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P370+P380 - In case of fire: Evacuate area
P372 - Explosion risk in case of fire
P373 - DO NOT fight fire when fire reaches explosives
P401 - Store local, regional, national, and international regulations
P403+P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up
P501 - Dispose of contents/container according to local, regional, national, and international regulations

Other Hazards:
Hazards Not Otherwise Classified (HNOC): Not available
Other Hazards: Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

<table>
<thead>
<tr>
<th>Mixture</th>
<th>Name</th>
<th>Product identifier</th>
<th>% (w/w)</th>
<th>Ingredient Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ammonium nitrate</td>
<td>(CAS No) 6484-52-2</td>
<td>30 - 80</td>
<td>Ox. Sol. 3, H272&lt;br&gt;Eye Irrit. 2A, H319</td>
</tr>
<tr>
<td></td>
<td>Calcium nitrate</td>
<td>(CAS No) 10124-37-5</td>
<td>0.1 - 35</td>
<td>Ox. Sol. 3, H272&lt;br&gt;Acute Tox. 4 (Oral), H302&lt;br&gt;Eye Dam. 1, H318</td>
</tr>
<tr>
<td></td>
<td>Sodium nitrate</td>
<td>(CAS No) 7631-99-4</td>
<td>0.1 - 18</td>
<td>Ox. Sol. 3, H272&lt;br&gt;Acute Tox. 4 (Oral), H302&lt;br&gt;Eye Irrit. 2A, H319</td>
</tr>
<tr>
<td></td>
<td>*Fuels, diesel, no. 2</td>
<td>(CAS No) 68476-34-6</td>
<td>0.1 - 8</td>
<td>Flam. Liq. 3, H226&lt;br&gt;Acute Tox. 4 (Inhalation), H332</td>
</tr>
</tbody>
</table>
**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:** If symptoms occur, go into fresh air and ventilate suspected area. Seek medical attention.

**Skin Contact:** Remove contaminated clothing. Wash with soap and water followed by rinsing with water. Seek medical attention if irritation develops or persists. Wash contaminated clothing before reuse.

**Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists.

**Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention immediately.

**Most Important Symptoms and Effects Both Acute and Delayed**

**General:** May be harmful if swallowed. Causes serious eye damage. Skin irritation.

**Inhalation:** May cause respiratory irritation.

**Skin Contact:** May cause skin irritation.

**Eye Contact:** Causes eye irritation.

**Ingestion:** May be harmful if swallowed. May be harmful if swallowed and enters airways.

**Chronic Symptoms:** Contains an ingredient that may cause cancer. Causes damage to organs through prolonged or repeated exposure.

**Indication of Any Immediate Medical Attention and Special Treatment Needed**

If symptoms occur, seek medical attention.

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**Section 5 - Fire-Fighting Measures**

**Extinguishing Media**

**Suitable Extinguishing Media:** DO NOT FIGHT FIRES INVOLVING EXPLOSIVES.

**Unsuitable Extinguishing Media:** Not available

**Special Hazards Arising From the Substance or Mixture**

**Fire Hazard:** In case of fire involving explosives. DO NOT fight fires involving explosives. Consult the most current Emergency Response Guidebook (ERG), Guide 112 for additional information. Extreme risk of explosion from shock, friction, fire or other sources of ignition.

**Explosion Hazard:** Extreme risk of explosion by shock, friction, fire, impact, heat or other sources of ignition.

**Reactivity:** Accelerates the rate of burning materials.

**Advice for Firefighters**

**Precautionary Measures Fire:** 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. Can explode or detonate under fire conditions. Burning material may produce toxic vapors. It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.

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

**Other Information:** 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.
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: Evacuate all non-essential personnel from immediate area and establish a "regulated zone" with site control and security.

For Non-Emergency Personnel

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


For Emergency Personnel

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

Emergency Procedures: Ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes as necessary to prevent migration and entry into sewers or streams. Do not take up in combustible material such as: saw dust or cellulosic material.

Methods for Cleaning Up: Collect spillage for possible reuse. Clean up spills immediately and dispose of waste in accordance with appropriate State, Federal and local regulations.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection

SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling: It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.

Additional Hazards When Processed: When heated to decomposition, emits toxic fumes. Do not puncture or incinerate container.

Hygiene Measures: 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

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from combustible materials, extremely high temperatures, direct sunlight, ignition sources, incompatible materials.

Incompatible Materials: Corrosives, strong acids, strong bases and alkalis.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

<table>
<thead>
<tr>
<th>Fuels, diesel, no. 2 (68476-34-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA ACGIH</td>
</tr>
<tr>
<td>Alberta</td>
</tr>
<tr>
<td>British Columbia</td>
</tr>
<tr>
<td>Manitoba</td>
</tr>
<tr>
<td>Newfoundland &amp; Labrador</td>
</tr>
<tr>
<td>Nova Scotia</td>
</tr>
<tr>
<td>Ontario</td>
</tr>
<tr>
<td>Prince Edward Island</td>
</tr>
<tr>
<td>Saskatchewan</td>
</tr>
<tr>
<td>Saskatchewan</td>
</tr>
</tbody>
</table>

Exposure Controls

Appropriate Engineering Controls: Ensure all national/local regulations are observed. Ensure adequate ventilation,
### SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

**Information on Basic Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>White, yellow or pink opaque viscous liquid.</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight fuel oil odor.</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>pH</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Evaporation Rate (butylacetate=1)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Auto-ignition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not available</td>
</tr>
<tr>
<td>Lower Flammable Limit</td>
<td>Not available</td>
</tr>
<tr>
<td>Upper Flammable Limit</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Vapor Density at 20 °C</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.00 - 1.45 g/cc</td>
</tr>
<tr>
<td>Solubility</td>
<td>Water: Nitrate salts are completely soluble, but emulsion dissolution is very slow.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Explosion Data – Sensitivity to Mechanical Impact</td>
<td>Not sensitive to mechanical impact. May be sensitive to supersonic explosively driven projectile impacts.</td>
</tr>
<tr>
<td>Explosion Data – Sensitivity to Static Discharge</td>
<td>Not sensitive to static discharge.</td>
</tr>
</tbody>
</table>
SECTION 10 - STABILITY AND REACTIVITY

Reactivity: Accelerates the rate of burning materials. Oxidizer. May react violently with strong acids, strong oxidizing and reducing agents.

Chemical Stability: May intensify fire; oxidizer. May explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.


Incompatible Materials: Corrosives, strong acids, strong bases and alkalis.


SECTION 11 - TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity: Harmful if swallowed.

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not available

Carcinogenicity: Contains an ingredient suspected of causing cancer.

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): Not classified

Aspiration Hazard: May be fatal if swallowed and enters airways.

Symptoms/Injuries After Inhalation: May cause respiratory irritation.

Symptoms/Injuries After Skin Contact: May cause skin irritation.

Symptoms/Injuries After Eye Contact: Causes eye irritation.

Symptoms/Injuries After Ingestion: May be harmful if swallowed. May be harmful if swallowed and enters airways. Aspiration into the lungs can occur during ingestion or vomiting and may cause lung injury.

Chronic Symptoms: Contains an ingredient that may cause cancer. Causes damage to organs through prolonged or repeated exposure.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>LD50 Oral Rat</th>
<th>LC50 Inhalation Rat</th>
<th>ATE CLP (oral)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium nitrate (6484-52-2)</td>
<td>2217 mg/kg</td>
<td>&gt; 88.8 mg/l/4h</td>
<td>2217.000 mg/kg body weight</td>
</tr>
<tr>
<td>Sodium nitrate (7631-99-4)</td>
<td>1267 mg/kg</td>
<td></td>
<td>1267.000 mg/kg body weight</td>
</tr>
<tr>
<td>Fuels, diesel, no. 2 (68476-34-6)</td>
<td></td>
<td></td>
<td>11,000 mg/l/4h</td>
</tr>
<tr>
<td>Distillates, petroleum, chemically neutralized light naphthenic (64742-35-4)</td>
<td></td>
<td>&gt; 5000 mg/kg</td>
<td>&gt; 2000 mg/kg</td>
</tr>
</tbody>
</table>
SECTION 12: ECOLOGICAL INFORMATION

Toxicity  Not classified

Sodium nitrate (7631-99-4)
LC50 Fish 1  2000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
LC 50 Fish 2  994.4 - 1107 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])

Calcium nitrate (10124-37-5)
LC50 Fish 1  10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

Fuels, diesel, no. 2 (68476-34-6)
LC50 Fish 1  35 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])

Persistence and Degradability

Sodium nitrate (7631-99-4)
Persistence and Degradability  Not established.

Bioaccumulative Potential

Bulk Emulsion
Bioaccumulative Potential  Not expected to bioaccumulate.

Ammonium nitrate (6484-52-2)
BCF fish 1  (no bioaccumulation expected)
Log Pow  -3.1 (at 25 °C)

Sodium nitrate (7631-99-4)
Log Pow  -3.8 (at 25 °C)
Bioaccumulative Potential  Not expected to bioaccumulate.

Mobility in Soil  Not available

Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Treatment Methods: Contact manufacturer for advice on proper disposal methods.

Waste Disposal Recommendations: Collect spillage for possible reuse. Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

Additional Information: Clean up even minor leaks or spills if possible without unnecessary risk.

SECTION 14 - TRANSPORT INFORMATION

14.1 In Accordance with DOT
Proper Shipping Name  EXPLOSIVE, BLASTING, TYPE E or Agent blasting, Type E
Hazard Class  1.5D
Identification Number  UN0332
Label Codes  1.5D
Packing Group  II
ERG Number  140

14.2 In Accordance with IMDG
Proper Shipping Name  EXPLOSIVE, BLASTING, TYPE E (AGENT, BLASTING, TYPE E)
Hazard Class  1.5D
Identification Number  UN0332
Label Codes  1.5D
EmS-No. (Fire)  F-B
EmS-No. (Spillage)  S-Y
### SECTION 15 - REGULATORY INFORMATION

**US Federal Regulations**

**Bulk Emulsion**

<table>
<thead>
<tr>
<th>SARA Section 311/312 Hazard Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate (acute) health hazard</td>
</tr>
<tr>
<td>Reactive hazard</td>
</tr>
<tr>
<td>Delayed (chronic) health hazard</td>
</tr>
<tr>
<td>Fire hazard</td>
</tr>
</tbody>
</table>

- **Ammonium nitrate (6484-52-2)**
- Listed on the United States TSCA (Toxic Substances Control Act) inventory

- **Sodium nitrate (7631-99-4)**
- Listed on the United States TSCA (Toxic Substances Control Act) inventory

- **Calcium nitrate (10124-37-5)**
- Listed on the United States TSCA (Toxic Substances Control Act) inventory

- **Fuels, diesel, no. 2 (68476-34-6)**
- Listed on the United States TSCA (Toxic Substances Control Act) inventory

- **Distillates, petroleum, chemically neutralized light naphthenic (64742-35-4)**
- Listed on the United States TSCA (Toxic Substances Control Act) inventory

**US State Regulations**

- **Ammonium nitrate (6484-52-2)**
  - 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

- **Sodium nitrate (7631-99-4)**
  - U.S. - Massachusetts - Right To Know List
  - U.S. - Pennsylvania - RTK (Right to Know) List

- **Calcium nitrate (10124-37-5)**
  - U.S. - New Jersey - Right to Know Hazardous Substance List

- **Fuels, diesel, no. 2 (68476-34-6)**
  - U.S. - New Jersey - Right to Know Hazardous Substance List

**Canadian Regulations**

- **Bulk Emulsion**

<table>
<thead>
<tr>
<th>WHMIS Classification</th>
<th>Class C - Oxidizing Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class D Division 2 Subdivision B - Toxic material causing other toxic effects</td>
</tr>
</tbody>
</table>
### Ammonium nitrate (6484-52-2)
Listed on the Canadian DSL (Domestic Substances List) inventory.

<table>
<thead>
<tr>
<th>WHMIS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class C - Oxidizing Material</td>
</tr>
<tr>
<td>Class D Division 2 Subdivision B - Toxic material causing other toxic effects</td>
</tr>
</tbody>
</table>

### Sodium nitrate (7631-99-4)
Listed on the Canadian DSL (Domestic Substances List) inventory.
Listed on the Canadian Ingredient Disclosure List

<table>
<thead>
<tr>
<th>WHMIS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class C - Oxidizing Material</td>
</tr>
<tr>
<td>Class D Division 2 Subdivision B - Toxic material causing other toxic effects</td>
</tr>
</tbody>
</table>

### Calcium nitrate (10124-37-5)
Listed on the Canadian DSL (Domestic Substances List) inventory.

### Fuels, diesel, no. 2 (68476-34-6)
Listed on the Canadian DSL (Domestic Substances List) inventory.

### Distillates, petroleum, chemically neutralized light naphthenic (64742-35-4)
Listed on the Canadian DSL (Domestic Substances List) inventory.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

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

**Revision date**: 11/01/2018

**Other Information**: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

### GHS Full Text Phrases:

- **Acute Tox. 4 (Inhalation)**: Acute toxicity (inhalation) Category 4
- **Acute Tox. 4 (Oral)**: Acute toxicity (oral) Category 4
- **Asp. Tox. 1**: Aspiration hazard Category 1
- **Carc. 2**: Carcinogenicity Category 2
- **Expl. 1.5**: Explosive Category 1.5
- **Eye Dam. 1**: Serious eye damage/eye irritation Category 1
- **Eye Irrit. 2A**: Serious eye damage/eye irritation Category 2A
- **Skin Corr. 1A**: Skin corrosion/irritation Category 1A
- **Skin Irrit. 2**: Skin corrosion/irritation Category 2
- **STOT RE 2**: Specific target organ toxicity (repeated exposure) Category 2
- **H205**: May mass explode in fire
- **H302**: Harmful if swallowed
- **H304**: May be fatal if swallowed and enters airways
- **H315**: Causes skin irritation
- **H320**: Causes eye irritation
- **H332**: Harmful if inhaled
- **H351**: Suspected of causing cancer
- **H373**: May cause damage to organs through prolonged or repeated exposure
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Dyno Nobel SDS