# Material Safety Data Sheet

## Section I – Chemical Product and Company Information

**MANUFACTURER:** Maxam North America, Inc.  
6975 South Union Park Center, Suite 525  
Salt Lake City, Utah 84047

**EMERGENCY CONTACT:** (801) 233-6000 (Maxam North America, Inc.) or (800) 424-9300 (CHEMTREC) or (304) 836-5646 (Maxam North America, Inc. Plant)

**TRADE NAME:** Z-BOOST™, RIOBOOSTER™ DET, RIOPRIME™ DET

**CAS NUMBER:** 1002.020-MAXAM

## Section II – Composition/Information on Ingredients

### Exposure Limits (mg/m³ unless noted)

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>% w/w Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNT (trinitrotoluene; trinitrotoluol; tolite)</td>
<td>118-96-7</td>
<td>0.1 mg/m³ TWA (skin)</td>
<td>As required 1.5 mg/m³ (skin)</td>
<td>-</td>
</tr>
<tr>
<td>RDX (cyclotrimethylene trinitramine; hexogen; cyclonite)</td>
<td>121-82-4</td>
<td>0.5 mg/m³ TWA (skin)</td>
<td>As required n/a 1.5 mg/m³ NIOSH (skin)</td>
<td>3.0 mg/m³ STEL (skin)</td>
</tr>
<tr>
<td>HMX (cyclotetramethylene tetranitramine; octogen)</td>
<td>2691-41-0</td>
<td>As required n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>PETN (pentaerythritol tetranitrate)</td>
<td>78-11-5</td>
<td>As required n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Section III – Hazards Identification

US OSHA HAZARD COMMUNICATION STANDARD: Under normal conditions of handling, the cast booster should not pose a serious health threat except possibly through post-detonation fumes.

**EYE:** Unlikely

**INHALATION:** Yes (post-detonation fumes)

**SKIN:** Unlikely

**INGESTION:** Yes (post-detonation fumes)

**SIGNS AND SYMPTOMS OF EXPOSURE:** Post-detonation fumes are toxic. NOTE: The following information is for the explosives constituents. Can cause allergic skin reaction and irritation to mucous membranes. Excessive exposure may cause convulsions, unconsciousness, headache, dizziness, flushing of skin, vomiting, fall in blood pressure, and methemoglobinemia. Inhalation and ingestion can result in systemic poisoning, usually affecting the bone marrow and the liver. Excessive exposure to TNT can cause liver damage; jaundice; cyanosis; sneezing; coughing and sore throat; peripheral neuropathy; muscular pain; kidney damage; cataracts; leukocytosis (increased blood leukocytes); cardiac irregularities; anorexia; nausea and vomiting; blood damage; and aplastic anemia. TNT can be absorbed through skin.

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:** Cardiovascular diseases, glaucoma, and liver, blood, and kidney disorders. Personnel should be in generally good health.

**DOT EMERGENCY RESPONSE GUIDE NO.:** 112

**HAZARD RATING:**
- Health: 2
- Flammability: 3
- Reactivity: 4
- Special: High Explosive Component
Section IV – First Aid Measures

**EFFECTS OF OVEREXPOSURE:**
- **Acute** – Slight to serious effects
- **Chronic** – Not fully known

Skin, hair, and nails may be stained yellow. Avoid inhalation and ingestion of dust, fumes, mist, or vapours.

**EMERGENCY AND FIRST AID PROCEDURES:**
- **Inhalation** – Remove to fresh air. Give oxygen if necessary. Get medical attention.
- **Ingestion** – If conscious, drink large quantities of water and induce vomiting immediately. Contact a physician or Poison Control Center immediately.
- **Skin** – Wash with soap and warm water. Get medical attention for rash or irritation.
- **Eyes** – Flush with copious amounts of clean or buffered water for at least 15 minutes. Remove contact lenses prior to flushing, if applicable. Seek medical attention.
- **Other** – Accidental detonation may result in severe personal injury. Provide first aid as applicable and obtain medical attention immediately.

**CARCINOGENICITY:**
- NTP – Not listed
- IARC Monographs – Not listed
- OSHA Regulated – Not listed

*NOTE: Per EPA-C: cyclonite and trinitrotoluene – possible human carcinogen*

Section V – Fire Fighting Measures

**FLASH POINT:** Not established
**FLAMMABLE LIMITS:** Not available
**UEL:** Not available
**EXTINGUISHING MEDIA:** Water sprinkler or deluge system which is automatically activated
**UNUSUAL FIRE & EXPLOSION HAZARDS:** HIGH EXPLOSIVE! The explosive materials are under confinement and may be caused to detonate by burning material surrounding the charges. Additional hazard would be secondary fragmentation.
**SPECIAL FIRE FIGHTING PROCEDURES:** Do not attempt to fight fires involving high explosives. Isolate area and immediately evacuate all personnel from the area to a safe distance using as much protective cover as possible.
Section VI – Accidental Release Measures

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**

- Remove all sources of ignition and avoid any and all situations which could initiate the material, such as heat and/or shock, sparks, impact, friction, or electrostatic discharge.
- Wet down material with water.
- Sweep up spill with a soft bristle brush and a non-sparking pan or shovel.
- Place material in a properly labeled storage container and store in an approved storage magazine for further disposition.

**WASTE DISPOSAL METHOD:** Dispose of in accordance with applicable local, state, and federal regulations.

Section VII – Handling and Storage

**DURING HANDLING AND STORAGE:** Handle with care. Store only authorized High Explosives magazine with compatible material and away from all sources of ignition and flammable materials. Do not store with detonators or initiating (primary) explosives.

**OTHER PRECAUTIONS:** Maxam’s cast booster is UNO Class 1.1 hazardous material and the storage compatibility group (SCG) is D. Material should remain in original shipping container or equivalent for storage purposes.

Section VIII – Exposure Control/Personal Protection

**RESPIRATORY:** Under normal handling, none required.

**VENTILATION:**
- Local Exhaust – Under normal handling, none required; Mechanical (General) – Under normal handling, none required; Special – n/a; Other – n/a.

**GLOVES:** Under normal handling, none required.

**EYE:** Safety glasses or goggles that meet or exceed ANSI Z87.1 (latest version).

**OTHER PROTECTIVE EQUIPMENT:** Hearing protection should be worn when detonating unit.
Section IX – Exposure Control/Personal Protection

**BOILING POINT:** 4640F (TNT explodes)

**MELTING POINT:** TNT – 790-800°C

**VAPOUR PRESSURE (MM Hg):** RDX/TNT – 0.1 @ 1000°C

**VAPOUR DENSITY (Air=1):** N/A

**DENSITY:** 1.15 minimum

**EVAPORATION RATE (Butyl Acetate=1):** N/A

**PERCENT VOLATILE BY VOLUME:** N/A

**SOLUBILITY IN WATER:** 0.01% @ 680°F (TNT)

**APPEARANCE AND ODOUR:** Cardboard tube containing tan to grayish-brown solid. No distinguishing odour.

Section X – Stability and Reactivity

**STABILITY:** Stable under normal conditions.

**CONDITIONS TO AVOID:** Avoid subjecting to heat, sparks, impact, friction, and electrostatic discharge.

**INCOMPATIBILITY (MATERIALS TO AVOID):** Alkalis, alkoxides, and ammonia react with TNT to form dangerously sensitive compounds. Avoid contact with potassium hydroxide, sodium carbonate, sodium sulfide, and potassium methylate. Avoid alkalis, acids, strong oxidizers, ammonia, reducing agents, initiating explosives, and physical sensitizers such as glass, sand, and metal fragments.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Toxic, avoid inhalation and ingestion. During decomposition, emits toxic oxides of nitrogen, carbon dioxide, carbon monoxide.

**HAZARDOUS POLYMERIZATION:** Will not occur.

Section XI – Toxicological Data

**ACUTE TOXICITY:** Not established

Section XII – Ecological Information

**ENVIRONMENTAL FATE AND EFFECTS:** Not established
Section XIII – Disposal Considerations

WASTE DISPOSAL: Dispose of in accordance with applicable local, state, and federal legislation.

RCRA INFORMATION: Materials in this product are subject to the reporting requirements of SARA, Title III, Section 313 as follows: None.

Section XIV – Transportation Information

REGULATORY CLASSIFICATIONS:

USA DOT: Boosters, 1.1D, UN0042, PG-II
OSHA: Boosters, 1.1D, UN0042

USA DOT:
SHIPPING NAME: Boosters
HAZARD CLASS AND DIV.: 1.1D
ID NUMBER: UN0042
APPROVAL No.: EX0102265
PACKING GROUP: II
DANGEROUS WHEN WET: No
POISON: No
LABEL(S): 1.1D
PLACARD(S): 1.1D
PRODUCT RQ: N/A
ERG NUMBER: 112

CANADA: Class 3.2, Boosters, UN0042, 1.1D, PG II

INTERNATIONAL: Boosters, 1.1D, UN0042, PG II

Section XV – Regulatory Information

GOVERNMENTAL INVENTORY STATUS:
All components comply with TSCA, and EINECS/ELINCS.

US SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III:
This product is considered an “Extremely Hazardous Substance.” This product contains Ammonium Nitrate which is reportable to SARA (313) Toxic Release Program.
Section XVI – Other Information

SPECIAL PRECAUTIONS:

CAUTION: High explosives are extremely dangerous. When initiated, the cast booster detonates producing a severe blast overpressure with the possibility of secondary fragments from the surface which the charge is placed against. The cast boosters should be handled only by qualified personnel who are experienced and highly trained in the use of and familiar with the hazards inherent with this product. When the cast booster is detonated or destructively tested, all personnel must be protected from the effects of blast overpressure and fragmentation. Allow the post-detonation fumes and dust to clear prior to entering the area. Follow all safety regulations and precautions when handling, storing, or processing explosive material.

The information contained herein is believed to be accurate and represents the best information currently available. Maxam North America, Inc. makes no warranties or guarantees with respect to the safety or suitability of this product or the results obtained, either expressed or implied. Buyer and user assume any and all risk, responsibility, and liability for any and all injury (including death), loss, or damage arising from usage.