

Accurate Energetic Systems, LLC

MATERIAL SAFETY DATA SHEET

M3A1 40 LB. DEMOLITION SHAPED CHARGE

MSDS NO. 1004.001

HAZARD RATING: **Health - 2** **Flammability - 3** **Reactivity - 4** **Special - High Explosive Component**

SECTION I - MANUFACTURE'S INFORMATION

Manufacture/Distributor Name: Accurate Energetic Systems, LLC
Address: 5891 Highway 230 West, McEwen, TN 37101
Telephone Number: (931) 729-4207
Emergency Telephone Number: 1-800-255-3924
Date Prepared: 04/24/01 **Supercedes:** 12/09/99

SECTION II - CHEMICAL COMPOSITION

| Component | CAS # | % | OSHA PEL | ACGIH TLV | Other Limits |
|--|-----------|---------------|--|-----------------------------------|---|
| <i>Composition B:</i> | | | | | |
| RDX (cyclotrimethylene trinitramine; hexogen; cyclonite) | 121-82-4 | 57.5% - 61.5% | n/a | 0.5 mg/m ³ TWA skin | 1.5 mg/m ³ NIOSH TWA 3.0 mg/m ³ STEL; skin |
| TNT (trinitrotoluene; trinitrotoluol; tolite) | 118-96-7 | 37.2% - 41.8% | 1.5 mg/m ³ skin | 0.1 mg/m ³ TWA skin | 0.5 mg/m ³ NIOSH TWA skin IDLH - 500 mg/m ³ |
| Desensitizing Wax (* These exposure limits are for paraffin wax fume, similar to this material) | | 0.7% - 1.3% | n/a | 2 mg/m ³ * | 2 mg/m ³ * NIOSH |
| Calcium Silicate | 1344-95-2 | 0.5% | 15 mg/m ³ (total dust) 5 mg/m ³ (resp. fract) | 10 mg/m ³ | 10 mg/m ³ (total dust) 5 mg/m ³ (resp. fract) - NIOSH |
| <i>Composition A-3:</i> | | | | | |
| RDX (cyclotrimethylene trinitramine; hexogen; cyclonite) | 121-82-4 | 90.3% - 91.7% | n/a | 0.5 mg/m ³ TWA skin | 1.5 mg/m ³ NIOSH TWA 3.0 mg/m ³ STEL; skin |
| Desensitizing Wax (* These exposure limits are for paraffin wax fume, similar to this material) | | 8.3% - 9.7% | n/a | 2 mg/m ³ * | 2 mg/m ³ * NIOSH |
| Steel (casing/liner) | | | n/a | n/a | n/a |

NOTE: Hazard Class 1, Division 1; SCG "D"

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

SECTION III - PHYSICAL AND CHEMICAL DATA (NOTE: Data is for Composition B and Composition A3 only except for "Appearance and Odor")

Boiling Point: 464⁰F (TNT explodes)
Specific Gravity: Composition B - 1.7; Composition A-3 - 1.8 (RDX)
Melting Point: RDX - 190⁰-200⁰C; TNT - 79⁰-80⁰C; Wax - 80⁰C

SECTION III - PHYSICAL AND CHEMICAL DATA (cont.)

| | |
|--|---|
| Vapor Pressure (mm Hg): | Composition B - 0.1 @ 100°C; Composition A-3 - 4.08×10^{-4} @ 110°C (RDX) |
| Vapor Density (Air = 1): | n/a |
| Evaporation Rate (Butyl Acetate = 1): | n/a |
| Solubility In Water: | 0.01% @ 68°F (TNT) |
| Appearance And Odor: | Conical shaped metallic container, painted green with yellow stripe, loaded with Composition B and containing a pellet comprised of Composition A-3. No distinguishing odor. |

SECTION IV - FIRE AND EXPLOSION HAZARDS

Flash Point: n/a

Flammable Limits: LEL n/a UEL n/a

Extinguishing Media: Water sprinkler or deluge system which is automatically activated.

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.

Unusual Fire And Explosion Hazards:

HIGH EXPLOSIVE!! The explosive materials are under confinement and may be caused to detonate by burning material surrounding the charges. Metallic fragments are a secondary hazard.

SECTION V - REACTIVITY/COMPATIBILITY DATA

Stability:

Stable under normal conditions. Avoid subjecting to heat and/or shock.

Incompatibility (materials to avoid):

Alkalis and acids which may react with the metallic casing. In case of exposure to explosive material: 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 VI - HEALTH HAZARD DATA

NOTE: Under normal conditions of handling, personnel should not come in contact with the explosive material in the shaped charge. The metallic casing should not pose a serious health threat except possibly through post-detonation fumes.

Routes Of Entry:

| | |
|--------------------|-----------------------------|
| Eye? | Unlikely |
| Inhalation? | Yes (post-detonation fumes) |
| Skin? | Unlikely |
| Ingestion? | Yes (post-detonation fumes) |

SECTION VI - HEALTH HAZARD DATA (cont.)

Effects Of Over-Exposure:

- Acute -** Slight to serious effects
Chronic - Not fully known

Signs And Symptoms Of Exposure:

Post-detonation fumes are toxic. NOTE: The following information is for Composition A-3 and Composition B. Can cause allergic skin reaction and irritation to mucous membranes. Excessive exposure may cause convulsions, unconsciousness. 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. Skin, hair, and nails may be stained yellow. Avoid inhalation and ingestion of dust, fumes, mist, or vapors.

Medical Conditions Generally Aggravated By Exposure:

Cardiovascular diseases and liver, blood, and kidney disorders. Personnel should be in generally good health

Emergency First Aid Procedures:

- Eye -** Flush with water for 15 minutes. Remove contact lenses prior to flushing, if applicable. Get medical attention.
- Inhalation -** Remove to fresh air. Give oxygen if necessary. Get medical attention.
- Skin -** Wash with soap and warm water. Get medical attention for rash or irritation.
- Ingestion -** If conscious, drink large quantities of water and induce vomiting immediately. Contact a physician or Poison Control Center immediately.
- 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 VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Follow If Material Is Spilled Or Released:

Should not occur due to the fact that the M3A1 40 lb. Demolition Shaped Charge is a sealed container. In case of extreme situation whereas the explosive material is exposed, 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.

Precautions To Be Taken In Handling And Storage:

Handle with care. Store only in authorized High Explosives magazine with compatible material and away from all sources of ignition and flammable materials. Do not store with detonators, initiating explosives, or any other material which could react with the metallic casing.

Other Precautions:

M3A1 40 lb. Demolition Shaped Charge 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 - PERSONAL PROTECTION INFORMATION

Respirator Protection (Specify Type):

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

Protective Gloves:

Under normal handling, none required.

Eye Protection:

Safety glasses or goggles that meet or exceed ANSI Z87.1 (latest revision)

Other Protective Clothing Or Equipment:

Hearing protection should be worn when detonating unit.

Work/Hygienic Practices:

n/a

SECTION IX - SPECIAL PRECAUTIONS

Precautions To Be Taken:

CAUTION: High explosives are extremely dangerous. When initiated, the M3A1 40 lb. Demolition Shaped Charge detonates producing a severe blast overpressure with high velocity metallic fragments being generated along with secondary fragments from the surface which the charge is placed against. The M3A1 40 lb. Demolition Shaped Charge 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 charge. When the M3A1 40 lb. Demolition Shaped Charge 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 utilizing explosive material.

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