



MATERIAL SAFETY DATA SHEET  
DYNO NOBEL INC.  
11<sup>TH</sup> FLOOR CROSSROADS TOWER  
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MSDS# 1121

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Supersedes MSDS  
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EBCo ENSI122

### SECTION I - PRODUCT IDENTIFICATION

**Trade Name(s):**

40 RDX NYLON LS	40 HMX NYLON LS
40 RDX NYLON RIBBON LS	40 HMX NYLON RIBBON LS
80 RDX NYLON	50 HMX LOPRO NYLON LS
80 RDX NYLON LS	60 HMX NYLON
80 RDX NYLON SO	60 HMX HI-TEMP RIBBON LS
80 RDX NYLON LS SO	80 HMX NYLON LS
80 RDX NYLON XHV LS	80 HMX HI-TEMP LS
100 Plastic Special	80 HMX NYLON XHV LS

**Product Class:** Detonating Cord, Specialty

**Product Appearance & Odor:** Flexible white or colored cord of woven textile with a protected explosive core of RDX or HMX (white crystalline powder) or alternate explosive material and covered by a white or colored plastic or textile jacket. May have a waxed finish. No odor.

**DOT Hazard Shipping Description:** Cord, detonating 1.1D UN0065 II -or-  
Cord, detonating 1.4D UN0289 II -or- Cord, detonating 1.4S UN0349 II

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

### SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS#	EXPOSURE LIMITS	
		OSHA PEL	TLV-ACGIH <sup>2</sup>
Pentaerythritol tetranitrate (PETN)	78-11-5	None <sup>1</sup>	None <sup>2</sup>
Cyclotrimethylene trinitramine (RDX)	121-82-4	None <sup>1</sup>	0.5 mg/m <sup>3</sup> (skin)
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	None <sup>1</sup>	None <sup>2</sup>
2,6-Bis(picrylamino)-3,5-dinitropyridine (PYX)	38082-89-2	None <sup>1</sup>	None <sup>2</sup>
Ammonium Hydroxide	1336-21-6	None <sup>1</sup>	None <sup>2</sup>
Tributyl phosphate	126-73-8	5 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>

<sup>1</sup> Use limit for particulates not otherwise regulated (PNOR): Total dust, 15 mg/m<sup>3</sup>; respirable fraction, 5 mg/m<sup>3</sup>.

<sup>2</sup> Use limit for particulates not otherwise classified (PNOC): Inhalable particulate, 10 mg/m<sup>3</sup>; respirable particulate, 3 mg/m<sup>3</sup>.

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).

\* Core powder is predominantly one of the four explosive powders (PETN, RDX, HMX or PYX) with the possible trace amount of the other listed hazardous material. The approximate amount of explosive in a given grade of cord is expressed as that number of grains of explosive per linear foot of cord.

Example: 80 RDX NYLON contains about 80 grains RDX per foot of cord. (1 gram/meter = 4.7 grains/foot)

### SECTION III - PHYSICAL DATA

**Boiling Point:** Not Applicable

**Percent Volatile by Volume:** Not Applicable

**Melting Point:** PETN decomposes at melting point, about 141°C  
HMX decomposes violently at melting point, about 278°C

RDX decomposes at 190 – 200°C  
PYX melts at 370°C

**Vapor Pressure:** Not Applicable

**Vapor Density:** (Air = 1) Not Applicable

**Solubility in Water:** Insoluble.

### 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, distant location. Allow fire to burn unless it can be fought remotely or with fixed extinguishing systems (sprinklers). For transportation fires involving large quantities of detonating cord, such as a trailer load, evacuate no less than 2,500 feet in all directions.

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

### SECTION V - HEALTH HAZARD DATA

#### Effects of Overexposure

This is a packaged product that will not result in exposure to the explosive core material under normal conditions of use.

**Eyes:** May cause irritation, redness and tearing. PYX is a known eye irritant.

**Skin:** May cause irritation.

**Ingestion:** PETN is moderately toxic if ingested. See systemic effects below. HMX and RDX are poisonous by ingestion. See systemic effects below.

**Inhalation:** See systemic effects below.

**Systemic or Other Effects:** PETN is a known coronary vasodilator, and ingestion or inhalation may result in a lowering of blood pressure, headache or faintness, and a decreased tolerance for grain alcohol. Repeated over-exposure may result in chest pains in the absence of exposure. Systemic effects by ingestion include dermatitis.

Nitramines (RDX, HMX) are known sensitizers, meaning some people tend to become highly allergic over time to these materials, particularly if ingested or inhaled. Breathing RDX dust can cause spasms, nasal and respiratory irritation and cardiovascular collapse, and may affect the central nervous system and liver.

Carcinogenicity: No constituents are listed by NTP, IARC or OSHA.

#### Emergency and First Aid Procedures

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

**Skin:** Wash thoroughly with soap and water. If skin irritation occurs, seek medical attention.

**Ingestion:** Seek medical attention. Treat ingestion of RDX with gastric wash.

**Inhalation:** Remove to fresh air. If symptoms persist, 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, impact, friction, electrostatic discharge and strong shock.

**Materials to Avoid (Incompatibility):** Corrosives (strong acids and strong bases or alkalis).

**Hazardous Decomposition Products:** Nitrogen Oxides (NO<sub>x</sub>), Carbon Monoxide (CO)

**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 all personnel to a safe distant area and allow to burn or fight fire remotely. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If explosive powder is spilled from damaged detonating cord, remove all other explosives from the spill area. Wet down and clean spilled powder using a damp sponge or rag, avoid applying friction or pressure to the explosive, and place in a (Velostat) electrically conductive bag. Contamination of this material with sand, grit or dirt will render the material more sensitive to detonation. 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.

**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.

## **SECTION VIII - SPECIAL PROTECTION INFORMATION**

**Ventilation:** Not required for normal handling.

**Respiratory Protection:** None normally required.

**Protective Clothing:** Work gloves and work clothing that reduce the possibility of skin abrasion and that would prevent contact with spilled explosive powder is suggested.

**Eye Protection:** Safety glasses or goggles are recommended.

**Other Precautions Required:** None.

## **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. Only properly qualified and authorized personnel should handle and use explosives. Keep away from heat, flame, ignition sources, impact, friction, electrostatic discharge and strong shock.

**Precautions to be taken during use:** Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death. Avoid breathing the fumes or gases from detonation of explosives. Detonation in confined or unventilated areas may result in exposure to hazardous fumes or oxygen deficiency.

**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**

This product contains the following substances that are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

<b><u>Chemical Name</u></b>	<b><u>CAS Number</u></b>	<b><u>% By Weight</u></b>
None		

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