

MATERIAL SAFETY DATA SHEET

MANUFACTURER:	GENERAL DYNAMICS ORDNANCE AND TACTICAL SYSTEMS – CANADA INC. 5, Montée des Arsenaux Le Gardeur, Québec, Canada J5Z 2P4
EMERGENCY PHONE NUMBER:	(450) 581-3080
24-HOUR NUMBER:	1 (613) 996-6666 (CANUTEC)
EMERGENCY RESPONSE PLAN:	ERP2-1388
MATERIAL:	CARTRIDGE 9MM GREENSHIELD® FRANGIBLE NON-TOXIC
N.S.N.	1305-20-002-5523
ISSUE DATE:	September 28, 2007

<i>SECTION #1: PRODUCT INFORMATION</i>	
Product Family:	CARTRIDGE, 9MM
Proper Shipping Name:	CARTRIDGES FOR WEAPONS, INERT PROJECTILE; or CARTRIDGES, SMALL ARMS
Class:	1.4S, UN0012

<i>SECTION # 2: HAZARDOUS INGREDIENTS</i>				
COMPONENTS	%	CAS NUMBER	LD ₅₀ OF MATERIAL (SPECIES AND ROUTE)	LC ₅₀ OF MATERIAL (SPECIES)
Cartridge case				
Copper	26	7440-50-8	Not established	Not established
Zinc	11	7440-66-6	Not established	Not established
Projectile				
Copper	49	7440-50-8	Not established	Not established
Nylon	3	25035-04-5	Not established	Not established
Propellant				
Nitrocellulose	4	9004-70-0	Not established	Not established
Nitroglycerin	0.1-1	55-63-0	105 mg/kg oral rat	Not established
Diphenylamine	<0.1	122-39-4	300 mg/kg oral guinea pig	Not established
Primer				
Diazodinitrophenol (DDNP)	<0.1	87-31-0	Not established	Not established
Potassium nitrate	<0.1	7757-79-1	3750 mg/kg oral rat	Not established
Pentaerythritol (PETN)	<0.1	115-77-5	25500 mg/kg oral mouse	Not established

SECTION # 3: PHYSICAL DATA**PHYSICAL DATA:**

Boiling Point:	Not Applicable
Melting Point:	Not Applicable
Vapour Pressure:	Not Applicable
Solubility (Water):	None
Evaporation Rate:	Not Applicable
Percent Volatile:	Not Applicable
Vapour Density (AIR-1):	Not Applicable
Bulk Density:	Not Applicable
Appearance:	Small calibre cartridge: copper alloy cartridge case and copper/nylon projectile
Odour:	None
Odour Threshold:	None
Flammable:	Yes
Pyrophoric:	Not established
Explosive:	Yes
Unstable:	No
Water Reactive:	Yes

SECTION # 4: FIRE & EXPLOSION DATA

Flash Point:	Not Established
Auto Ignition Temperature:	120°C (250°F) (primer formulation)
Upper Explosive Limits (%):	Not Established
Lower Explosive Limits (%):	Not Established

Fire and Explosion Hazards:

May ignite if heated to 120°C (250°F) independent of air.

Unconfined ignited cartridges can produce low velocity metallic fragments which may cause eye injury or superficial skin wounds if unprotected by standard firefighter turnout gear.

Fire may produce irritating, corrosive and/or toxic gases.

Extinguishing Media:	Water
-----------------------------	-------

Special Fire Fighting Instructions:**Cargo fires:**

SECTION # 4: FIRE & EXPLOSION DATA

Packages bearing the 1.4S label or packages containing material classified as 1.4S are designed or packaged in such manner that when involved in a fire, may burn vigorously with localized detonations and projection of fragments.

Effects are usually confined to immediate vicinity of packages.

If fire threatens cargo area containing packages bearing the 1.4S label or packages containing material classified as 1.4S, consider isolating at least 15 meters (50 feet) in all directions. Fight fire with normal precautions from a reasonable distance.

Tire or vehicle fires:

Use plenty of water - FLOOD it! If water is not available, use CO2, dry chemical or dirt.

If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.

Pay special attention to the tire fires as re-ignition may occur. Stand by with extinguisher ready.

Evacuation:

Large spill: Consider initial evacuation for 50 meters (150 feet) in all direction.

The evacuation radius will vary according the atmospheric conditions.

Supplemental Information:

Transportation Emergencies: Contact CANUTEC at (613) 996-6666. Consult the Transport Canada Response Guide book for instructions for handling emergencies involving this product.

SECTION # 5: REACTIVITY DATA

Stability	Stable under normal use conditions
Polymerization	Will not occur
Conditions to avoid	Individual cartridges may ignite if the primer is struck. Cartridge may ignite if heated to 120 °C (250 °F) independent of air
Incompatible Materials	Oils, Acids, Alkalis, Ammonia and other corrosive materials
Hazardous Decomposition Materials	Nitrogen Oxides, Carbon and Carbon Oxides, Sulfur and Sulfur Oxides, Ammoniac and Hydrogen Cyanide. Other dust and fumes may also be produced.

SECTION # 6: TOXICOLOGICAL PROPERTIES**Physical Hazards:**

Oxidizer:	Yes
Organic Peroxide:	No
Corrosive:	No

Compressed gas:	No
Irritant:	Yes
Skin Hazard:	Yes
Eye Hazard:	Yes
Toxic Agent:	No
Sensitizer:	No
Carcinogen:	No
Reproductive Toxin:	No
Blood Toxin:	Yes (diphenylamine)
Nervous System Toxin:	No
Lung Toxin:	No
Liver Toxin:	Yes (diphenylamine)
Kidney Toxin:	Yes (diphenylamine)

Potential Health Effects:

Inhalation: After cartridges have been fired, dust, vapours, and/or fumes may be irritating to the respiratory system. *

Ingestion: After cartridges have been fired, dust vapours, and or fumes may be absorbed by the digestive system and be irritating. *

Skin Contact: After cartridges have been fired, dust, vapours, and/or fumes may cause irritation. *

Skin Absorption: After cartridges have been fired, dust can be absorbed through the pores if left on the skin. *

Eye Contact: After cartridges have been fired, dust, vapours, and/or fumes may cause irritation. *

Effects of Overexposure to products of combustion:

Acute Overexposure: If left untreated, weakness, vomiting, loss of appetite, uncoordinated body movements, convulsion, stupor, and possibly coma may occur. Damage is possible to the reproductive systems in both males and females. *

MATERIAL SAFETY DATA SHEET**SECTION # 6: TOXICOLOGICAL PROPERTIES****Exposure Limits of Material:**

COMPONENTS	ACGIH TLV (TWA)	OSHA PEL (TWA)	REMARKS
Cartridge case			
Copper (dust)	1 mg/m ³	1 mg/m ³	Irritation, Metal fume fever, Gastrointestinal
Zinc (as zinc oxide)	2 mg/m ³	5 mg/m ³	Metal fume fever
Projectile			
Copper (dust)	1 mg/m ³	1 mg/m ³	Irritation, Metal fume fever, Gastrointestinal
Nylon	Not established	Not established	
Propellant			
Nitrocellulose	Not established	Not established	
Nitroglycerin	0.05 ppm	0.2 ppm	Skin, Vasodilatation
Diphenylamine	10 mg/m ³	10 mg/m ³	A4, Liver & Kidney damage, hematologic effects
Primer			
Potassium Nitrate	Not established	Not established	
Diazodinitrophenol (DDNP)	Not established	Not established	
Pentaerythritol (PETN)	10 mg/m ³	15 mg/m ³	Eye and Upper respiratory tract irritation

CARCINOGENICITY DESIGNATION A4 - Not Classifiable as a Human Carcinogen: Agents which cause concern that they could be carcinogenic for human but which cannot be assessed conclusively because of lack of data. *In vitro* or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

NOTE: In many jurisdictions, exposure limits are similar to the ACGIH TLVs. Since the manner in which exposure limits are established, interpreted, and implemented can vary, obtain detailed information from the appropriate government agency in each jurisdiction.

Many jurisdictions have specific regulations requiring worksite programs for lead. Obtain detailed information from the appropriate government agency in each jurisdiction.

SECTION # 7: PREVENTIVE MEASURES**General Safety Precautions:**

Avoid impact on primer which is impact sensitive

Ventilation:

Use in well ventilated area

Protective Equipment – Eyes:

Wear ANSI-approved goggles or Safety glasses.

Protective Equipment – Gloves:

SECTION # 7: PREVENTIVE MEASURES

Not generally required.

Protective Equipment – Respirator:

Use NIOSH approved respirator to maintain exposure level below listed PEL's and or TLV's in a non-vented area.

Protective Equipment – Hearing Protection:

Hearing protection recommended. Hearing protection should have an EPA-NRR of 20 or greater.

Leak and Spill Procedure /Waste Disposal:

Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area)

All equipment used when handling the product must be grounded.

Do not touch or walk through spilled material.

Do not operate radio transmitters within 100 meters (330 feet) of electric detonators.

Do not clean up or dispose of, except under supervision of a specialist.

The recommended means for disposing of scrap material usually involves demilitarization of cartridges (i.e.: separating all explosive elements for individual destruction, it can also be done by open detonation but it is not the preferred way.

After components are scrapped by proper incineration, the remaining scrap material should be disposed of or recycled in accordance with all applicable local, provincial (state) and federal regulations.

Handling and Storage Precautions:

Store in a dry, cool area. Do not crush or drop packages. Avoid heat, electrical current, and acids. Keep away from fire, heat source or direct sunlight. GENERAL DYNAMICS ORDNANCE AND TACTICAL SYSTEMS – CANADA INC. products are packaged and shipped in accordance with applicable Transport Canada Regulations. To ensure the highest level of safety while storing these products, keep product in the original packaging until ready to use. When handling product, proper anti-static procedures should be maintained if loose powder is exposed.

SECTION # 8: FIRST AID MEASURES**Eyes:**

Wash with large amounts of fresh water for 20 minutes keeping eyelids open. Seek medical attention. *

Skin:

Wash contaminated area with soap and water for at least 20 minutes. *

Inhalation:

SECTION # 8: FIRST AID MEASURES

Remove from exposure, to fresh air. Get medical attention if experiencing effects of overexposure. *

Additional Information:

* All hazards marked with an asterisk (*) are not expected to be present unless the product is fired, or otherwise discharged so that gasses, fumes, or projectiles are created. Normal handling and shipping should not cause exposure to these hazards.

SECTION # 9: PREPARATION INFORMATION

Prepared by	Health and Security Department
Phone number:	(450) 581-3080
Date:	September 28 2007

NOTICE OF READER

Even though great care has been taken in the preparation of the present document GENERAL DYNAMICS ORDNANCE AND TACTICAL SYSTEMS – CANADA INC. offer no warranties and/or representation as to the accuracy or completeness of the information contained herein. GENERAL DYNAMICS ORDNANCE AND TACTICAL SYSTEMS – CANADA INC. will not assume responsibility towards the suitability of this information in regards to the user's intended purposes or the consequences of its use. The reader should determine the suitability of the information for their individual purpose.