

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:	1-888-992-3330 (Canada/U.S.A.) 1-514-981-5228 (International)
EMERGENCY RESPONSE PLAN:	ERP2-1388
MATERIAL:	CARTRIDGE 5.56 MM CQT
ISSUE DATE:	June, 2006

SECTION #1: PRODUCT INFORMATION	
Product Family:	CARTRIDGE, 5.56 MM
Proper Shipping Name:	CARTRIDGES FOR WEAPONS, INERT PROJECTILE; or CARTRIDGES, SMALL ARMS
Class:	1.4S, UN0012

SECTION #2: HAZARDOUS INGREDIENTS				
COMPONENTS	%	CAS NUMBER	LD ₅₀ OF MATERIAL (SPECIES AND ROUTE)	LC ₅₀ OF MATERIAL (SPECIES)
Cartridge case (brass)				
Copper	43	7440-50-8	Not established	Not established
Zinc	18	7440-66-6	Not established	Not established
Pojectile				
Polypropylene	1	9007-07-0	Not established	Not established
Sealing disc				
Acetal	0.1-1	105-57-7	4600 mg/kg oral rat	Not established
Formaldehyde	<0.1	50-00-0	800 mg/kg oral rat	590 mg/m ³ ihl rat
Sabot (aluminium alloy)				
Copper (dust)	2	7440-50-8		
Zinc (zinc oxide dust)	0.1-1	7440-66-6	Not established	Not established
Aluminium (dust)	30	7429-90-5	Not established	Not established
Lead (dust)	<0.1	7439-92-1	Not established	Not established
Propellant				
Nitrocellulose	0.1-1	9004-70-0	Not established	Not established
Nitroglycerine	<0.1	55-63-0	105 mg/kg oral rat	Not established
Diphenylamine	<0.1	122-39-4	Not established	Not established

SECTION # 2: HAZARDOUS INGREDIENTS

COMPONENTS	%	CAS NUMBER	LD ₅₀ OF MATERIAL (SPECIES AND ROUTE)	LC ₅₀ OF MATERIAL (SPECIES)
Graphite	<0.1	7782-42-5	Not established	Not established
Primer				
Lead Styphnate (as lead)	0.1-1	15245-44-0	Not established	Not established
Tetrazene	<0.1	31330-63-9	Not established	Not established
Antimony Sulfide (as antimony)	<0.1	1345-04-6	100 mgSb/100 g Rat ip	Not established
Barium Nitrate (as soluble barium compounds)	0.1-1	10022-31-8	355 mg/kg oral rat	Not established
Aluminium powder	<0.1	7429-90-5	Not established	Not established
Pentaerythritol (PETN)	<0.1	115-77-5	Not established	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 caliber cartridge, brass case and aluminium alloy sabot with a polypropylene projectile
Odour:	None
Odour Threshold:	None
Flammable:	Yes (propellant)
Pyrophoric:	Not established
Explosive:	Yes (primer)
Unstable:	No
Water Reactive:	Yes (primer)

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
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Special Fire Fighting Instructions:

Cargo fires:

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 directions.

The evacuation radius will vary according the atmospheric conditions.

Supplemental Information:

Transportation Emergencies: Contact

1-888-992-3330 (Canada/U.S.A.) 1-514-981-5228 (International)

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. Other dust and fumes may also be produced. (lead, barium, aluminium and antimony)

SECTION # 6: TOXICOLOGICAL PROPERTIES

Physical Hazards:

Oxidizer:	Yes (primer formulation)
Organic Peroxide:	No
Corrosive:	No
Compressed gas:	No
Irritant:	Yes
Skin Hazard:	Yes (Nitroglycerine)
Eye Hazard:	Yes
Toxic Agent:	No
Sensitizer:	Yes (formaldehyde)
Carcinogen:	No
Reproductive Toxin:	Yes (lead)
Blood Toxin:	Yes (lead and diphenylamine)
Nervous System Toxin:	Yes (lead)
Lung Toxin:	Yes (aluminium and antimony)
Liver Toxin:	Yes (diphenylamine)
Kidney Toxin:	Yes (lead and 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

SECTION # 6: TOXICOLOGICAL PROPERTIES

left on the skin. *

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

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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. *

SECTION # 6: TOXICOLOGICAL PROPERTIES**Exposure Limits of Material:**

COMPONENTS	ACGIH TLV (TWA)	OSHA PEL (TWA)	REMARKS
Cartridge case (brass)			
Copper (dust)	1 mg/m ³	1 mg/m ³	Irritation, Gastrointestinal (GI), Metal fever
Zinc	Not established	Not established	
Pojectile			
Polypropylene	Not established	Not established	
Sealing disc			
Acetal	Not established	Not established	
Formaldehyde*	1 ppm	1 ppm	A2, Sensitizer, Irritation
Sabot (aluminium alloy)			
Copper (dust)	1 mg/m ³	1 mg/m ³	Irritation, Gastrointestinal (GI), Metal fever
Zinc (zinc oxide dust)			
Aluminium (dust)	10 mg/m ³	15 mg/m ³	Irritation
Lead (dust)	0.05 mg/m ³	0.05 mg/m ³	A3, BEI, Central Nervous System (CNS), Blood, Kidney, Reproductive
Propellant			
Nitrocellulose	Not established	Not established	
Nitroglycerine	0.05 ppm	0.2 ppm	Skin, Cardiovascular System (CVS)
Diphenylamine	10 mg/m ³	Not established	A4, Liver, Kidney, Blood
Graphite	2 mg/m ³	Not established	Pneumoconiosis
Primer			
Lead Styphnate (as lead)	0.05 mg/m ³	0.05 mg/m ³	A3, BEI, Central Nervous System (CNS), Blood, Kidney, Reproductive
Tetrazene	Not established	Not established	
Antimony Sulfide	0.05 mg/m ³	0.05 mg/m ³	Irritation, Lung, Cardiovascular System (CVS)
Barium Nitrate (as soluble barium compounds)	0.5 mg/m ³	0.5 mg/m ³	A4, Irritation, Gastrointestinal (GI), Muscle
Aluminium (pyropowder)	5 mg/m ³	5 mg/m ³	Lung
Pentaerythritol (PETN)	10 mg/m ³	15 mg/m ³	Irritation

SECTION # 6: TOXICOLOGICAL PROPERTIES

*** NB : Formaldehyde : Formaldehyde is an ingredient of the polymeric matrix of the sealing disc and will not be present in air, except when complete incineration occurs, formaldehyde emission should be considered.**

CARCINOGENICITY DESIGNATION A4 - Not Classifiable as a Human Carcinogen: Inadequate data on which to classify the substance as a human and/or animal carcinogen.

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.

CARCINOGENICITY DESIGNATION A3 - Animal Carcinogen: Substance is carcinogenic in laboratory animals under conditions that are not considered relevant to worker exposure. Available human studies and evidence suggest that the substance is not likely to cause cancer in humans except under unusual or unlikely routes or levels of exposure. Worker exposure to an A3 carcinogen should be controlled to levels as low as reasonably achievable below the TLV.

CARCINOGENICITY DESIGNATION A2 – Suspected Human Carcinogen : Human data are accepted as adequate in quality but are conflicting or insufficient to classify the agent as a confirmed human carcinogen; OR, the agent is carcinogen in experimental animals at dose(s), by route(s) of exposure, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. The A2 is used primarily when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals with relevance to humans.

BIOLOGICAL EXPOSURE INDICES (BEIs): The ACGIH has adopted a BEI for this chemical. BEIs provide an indication of worker exposure by measuring the chemical or its breakdown products in the body or by measuring biochemical changes resulting from exposure to the chemical. Consult the BEI documentation for further information.

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:

Not generally required.

Protective Equipment – Respirator:

SECTION # 7: PREVENTIVE MEASURES

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 at least 20 minutes keeping eyelids open. Seek medical attention. *

Skin:

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

Inhalation:

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

Additional Information:

SECTION # 8: FIRST AID MEASURES

* 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:	June, 2006

NOTICE OF READER

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