MATERIAL SAFETY DATA SHEET

Olin MSDS No.: 00078.0001	**Revision Date:** 1/1/11
Revision No.: 14	**Supercedes:** 1/1/10

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: **EJECTION CARTRIDGES**
Chemical Name: Mixture
Synonyms: Impulse Cartridge; EC863-1A-1W; EC446-1A-1W; EC446-1B
Chemical Family: Mixture
Formula: Not applicable - mixture
Product Use/ Description: Medium Caliber Gas Generating Cartridge

COMPANY ADDRESS
MSDS Control Group
Olin Corporation - Winchester Division, Inc.
600 Powder Mill Road
East Alton, IL 62024
www.winchester.com

TECHNICAL INFORMATION:
618-258-3507

EMERGENCY TELEPHONE NUMBER:
618-258-2111

2. COMPOSITION / INFORMATION ON INGREDIENTS

Consists of the following components: A) Shell Case; B) Electric Primer; C) Wad (either Nitrocellulose wad for Ejection Cartridge or Mylar Wad for Ejection Cartridge; D) Smokeless Base Powder; and E) Double Base Powder.

CAS Number	Components	% By Weight	EINECS/ ELINCS #	EU Classification	
				Symbol	R-Phrase
7429-90-5	Aluminum	57 - 74	231-072-3	None	None
7440-50-8	Copper	1 - 6	231-159-6	None	None
15245-44-0	Normal Lead styphnate	0.1 – 0.5	239-290-0	E, T, N	R61-3-20/22-33-50/53-62
12403-82-6	Basic lead styphnate	0.1 – 0.5	235-642-2	E, T, N*	R61-3-20/22-33-50/53-62
9004-70-0	Nitrocellulose	1 - 6	Not listed	E*	R 2
55-63-0	Nitroglycerin	0 – 5	200-240-8	E, T+, N	R 3-26/27/28-33-51-53
7757-79-1	Potassium nitrate	>1	231-818-8	O*, Xi	R8-R36/38
Wad (used in the Impulse Cartridge or EC863-1A-1Wor EC446-1A-1W Cartridge)					
9004-70-0	Nitrocellulose	1 – 2.5	Not listed	E8*	R 2
Wad (used in the EC446-1B Cartridge)					
25038-59-9	Polyethylene terphthalate	2.5	Polymer	None	None

*This material is not listed in Annex 1 of Directive 88/379/EEC. Olin has classified the material according to the conventional method based upon information from similar materials.

OSHA REGULATORY STATUS: Explosive

3. HAZARDS IDENTIFICATION

CAUTION!

EXPLOSIVE. KEEP AWAY FROM HEAT. DO NOT SUBJECT TO MECHANICAL SHOCK. PARTICLES FROM FIRING MAY BE HARMFUL IF INHALED. DO NOT TAKE INTERNALLY.

HAZARD RATINGS (for dust or fume) Degree of hazard (0 = low, 4 = extreme)

Hazardous Materials Identification System (HMIS) Health: 0 Flammability: 2 Physical Hazard: Explosive: 2

National Fire Protection Association (NFPA) Mixture. Not rated.

HUMAN THRESHOLD RESPONSE DATA

Odor Threshold:	Unknown
Irritation Threshold:	Unknown
Immediately Dangerous to Life or Health (IDLH) Value(s):	The IDLH for this product is not known. The IDLH for copper and lead is 100 mg/m^3.

POTENTIAL HEALTH EFFECTS

This product is composed of a metal capsule which contains the various components completely sealed within. Therefore, under normal handling of this product, no exposure to any harmful materials will occur.

When the product is fired, a small amount of particles may be generated which may be slightly irritating to the eyes and the respiratory tract. The particles may contain trace amounts of these harmful substances:

Lead: Ingestion of large amounts of lead can cause abdominal pain, constipation, cramps, nausea and/or vomiting. Chronic exposure to lead can cause kidney damage, anemia, reproductive effects, developmental effects and permanent nervous system damage in humans including changes in cognitive function.
Copper: Inhalation of high concentrations of metallic copper dusts or fumes may cause nasal irritation and/or nausea, vomiting and stomach pain.
Nitroglycerin: Will produce dilation of blood vessels and drop in blood pressure which may affect the heart. It has also been shown to cause methemoglobinemia (cyanosis).
Potassium nitrate: Ingestion of large doses of potassium nitrate can lead to the development of methemoglobinemia (inability of the blood to carry sufficient oxygen). It is not anticipated that exposure from this product would cause this effect.

It is unlikely that the amount of particles that someone would be exposed to from firing would be sufficient to cause any of these effects.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: There are no medical conditions known to be aggravated by exposure to this product in its solid form. Exposure to lead can aggravate anemia, cardiovascular and respiratory disease.

POTENTIAL ENVIRONMENTAL EFFECTS: Product has not been tested for environmental properties.

4. FIRST AID MEASURES

EYE CONTACT:	Immediately flush out fume or particles with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician at once.
SKIN CONTACT:	Wash skin with plenty of soap and water.
INHALATION:	If symptoms of lung irritation occur (coughing, wheezing or breathing difficulty), remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Get medical attention.
INGESTION:	If ingested, immediately call a physician.

5. FIRE FIGHTING MEASURES

PROPERTY	*VALUE*	*PROPERTY*	*VALUE*
Explosive	Yes	Flammable	Not applicable
Combustible	Not applicable	Pyrophoric	No
Flash Point (°C):	Not applicable	Burning Rate of Material:	Not applicable
Lower Explosive Limit:	Not applicable	Autoignition Temp.:	288°C (550°F)
Upper Explosive Limit:	Not applicable	Flammability Classification: (defined by 29 CFR 1910.1200)	Explosive

UNUSUAL FIRE AND EXPLOSION HAZARDS:	None.
EXTINGUISHING MEDIA:	Water spray.
SPECIAL FIREFIGHTING PROCEDURES:	In case of fire, of if the fire reaches the cargo, use normal fire fighting equipment. Turnout gear supplies sufficient fire fighter protection from the explosive characteristics of this product.

6. ACCIDENTAL RELEASE MEASURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

Spills of this material should be handled carefully. Do not subject materials to mechanical shock. A spill of this material will normally not require emergency response team capabilities. If, however, a large spill occurs, call 1-888-289-1911 for technical assistance.

7. HANDLING AND STORAGE

HANDLING:	No special requirements
STORAGE:	Do not store at temperatures above 130°F
Shelf Life Limitations:	Indefinite at 50 - 90°F and 35% relative humidity
Incompatible Materials for Packaging:	None known
Incompatible Materials for Storage or Transport:	Acids, Class A & B explosives, strong oxidizers, and caustics
CONDITIONS TO AVOID*:*	Mechanical impact or shock and electrical discharge.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	*CHEMICAL NAME*	*ACGIH TLV*	*OSHA PEL*	*INTERNATIONAL OELS*
7440-50-8	Copper	0.2 mg/m^3 (fume), 1 mg/m^3 (dusts and mists)	0.1 mg/m^3 (fume) 1 mg/m^3 (dusts and mists)	Austria, Belgium, Canada: 0.2 mg/m^3 (fumes), 1 mg/m^3 (dusts) Denmark: 1.0 mg/m^3 (dust and powder) Germany (MAK): 0.1 mg/m^3 (fume), 1 mg/m^3 (dusts and mists)
15245-44-0	Normal Lead styphnate	None established	None established	None established
12403-82-6	Basic lead styphnate	None established	None established	None established
7429-90-5	Aluminum*	10 mg/m^3	15 mg/m^3	Belgium, France, Hungary , Sweden– 5 mg/m^3 (resp. dust) Germany, Switzerland – 6 mg/m^3 Denmark, Netherlands, U.K. – 10 mg/m^3
9004-70-0	Nitrocellulose	None established	None established	None established
55-63-0	Nitroglycerin	0.05 ppm (0.46 mg/m^3) Skin	Ceiling – 0.2 ppm (2 mg/m^3) Skin	Denmark: 0.02 ppm (0.2 mg/m^3) Norway, Sweden: 0.03 ppm (0.3 mg/m^3) Austria, Belgium, Germany, The Netherlands, Poland, Switzerland: 0.05 ppm (0.47 mg/m^3), skin Finland, France: 0.1 ppm (0.9 mg/m^3), skin U.K.: 0.2 ppm (2 mg/m^3), skin
7757-79-1	Potassium nitrate	None established	None established	None established
25038-59-9	Polyethylene terphthalate	None established	None established	Russia: 5 mg/m^3

*This substance is regulated by OSHA as a Particulate Not Otherwise Regulated (PNOR). The exposure limits listed for both OSHA and ACGIH refer to total dust; the OSHA PEL for the respirable fraction is 5 mg/m^3.

ENGINEERING CONTROLS:	Local exhaust ventilation is recommended if significant dusting occurs or fumes are generated. Otherwise, use general exhaust ventilation. Use explosion-proof ventilation.
EYE / FACE PROTECTION*:*	Use safety glasses.
SKIN PROTECTION*:*	Not normally needed
RESPIRATORY PROTECTION*:*	Respiratory protection not normally needed.
GENERAL HYGIENE*:*	Do not eat, drink, or smoke while using this product. Wash hands thoroughly after use.

9. PHYSICAL AND CHEMICAL PROPERTIES

PROPERTY	*VALUE*	*PROPERTY*	*VALUE*
Appearance:	Headed aluminum cylinder	*Vapor Density (air = 1):*	Not applicable
Odor:	None	*Boiling Point (°F):*	Not applicable
Molecular Weight:	Not applicable - Mixture	*Melting point:*	Not applicable
Physical State:	Solid	*Specific gravity (g/cc):*	Not applicable
pH:	Not applicable	*Bulk Density*	Not applicable
Vapor Pressure (mm Hg):	Not applicable	*Viscosity (cps):*	Not applicable
Vapor Density	Not applicable	*Decomposition Temperature:*	Not applicable
Solubility in Water (20 °C):	Insoluble	*Evaporation Rate:*	Not applicable
Volatiles, Percent by volume:	Not applicable	*Octanol/water partition coefficient:*	Not applicable

10. STABILITY AND REACTIVITY

STABILITY*:*	Stable under normal temperatures and pressure.
MATERIALS TO AVOID:	Acids, Class A & B explosives, strong oxidizers, and caustics
HAZARDOUS DECOMPOSITION PRODUCTS:	Nitrogen oxides, carbon monoxide, lead oxides, carbon dioxide, lead dust/fume
HAZARDOUS POLYMERIZATION*:*	Will not occur.
OTHER:	**Cartridge may detonate if case is punctured or severely damaged.**

11. TOXICOLOGICAL INFORMATION

POTENTIAL EXPOSURE ROUTES: The physical nature of this product makes absorption from any route unlikely. A small amount of inhalable particles may be created when projectile is fired.

ACUTE ANIMAL TOXICITY DATA:

For Product:		For Components							
		Copper	Aluminum	Nitrocellulose	Nitroglycerin	Potassium nitrate	Normal Lead styphnate	Basic Lead styphnate	Polyethylene terephthalate
Oral LD_{50}	Not applicable for product	3.5 mg/kg (mouse, intraperi-toneal)	No data	> 5 g/kg (rat)	105 mg/kg (rat)	3750 m/kg (rat)	No data	No data	No data
Dermal LD_{50}	Not applicable for product	375 mg/kg (rabbit, subcutan-eous)	No data	No data	> 280 mg/kg (rabbit)	No data	No data	No data	No data
Inhalation LC_{50}	Not applicable for product. Particles generated from firing may be slightly toxic.	No data	> 1000 mg/m^3 (4 hours, rat	No data	No data	No data	No data	No data	No data
Irritation	Not a skin or eye irritant as a loaded round.	Respiratory irritant	Mild eye and skin irritant	No data	Mild eye and skin irritant	No data	No data	No data	No data

SUBCHRONIC/ CHRONIC TOXICITY*:* Lead has caused blood, kidney and nervous system damage in laboratory animals.

CARCINOGENICITY*:* The International Agency for Research on Cancer (IARC) lists lead as possibly carcinogenic to humans, group 2B.

MUTAGENICITY: This product is not known or reported to be mutagenic. Lead has been shown to be mutagenic in several *in vitro* assays.

REPRODUCTIVE, TERATOGENICITY, OR DEVELOPMENTAL EFFECTS*:* This product is not known or reported to cause reproductive or developmental effects. Lead has been shown to affect fetal development including birth defects and reduce male reproductive function in laboratory animals.

NEUROLOGICAL EFFECTS: This product is not known or reported to cause neurological effects. Lead has caused peripheral and central nervous system damage and behavioral effects in laboratory animals.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY*:* None known or reported.

12. ECOLOGICAL INFORMATION

ECOTOXICITY: No data is available on this product. Individual constituents are as follows:

Copper: The toxicity of copper to aquatic organisms varies significantly not only with the species, but also with the physical and chemical characteristics of the water, such as its temperature, hardness, turbidity and carbon dioxide content. Copper concentration varying from 0.1 to 1.0 mg/l have been found by various investigators to be not toxic for most fish. However, concentrations of 0.015 to 3.0 mg/l have been reported as toxic, particularly in soft water to many kinds of fish, crustacea, mollusks, insects, and plankton.

Lead: LC 50 (48 hrs.) to bluegill (Lepomis macrochirus) is reported to be 2-5 mg/l. Lead is toxic to waterfowl.

Nitrocellulose: LC_{50} > 1000 mg/l (fish, invertebrates, algae)

Nitroglycerin: Bluegill, 96 hour LC_{50} = 1.228 mg/l (static)

MOBILITY: Dissolved lead may migrate through soil.

PERSISTANCE/DEGRADABILITY: Not biodegradable. May decompose in soil leading to accumulation of lead.

BIOACCUMULATION: No data

13. DISPOSAL CONSIDERATIONS

Care must be taken to prevent environmental contamination from the use of this material. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.

14. TRANSPORT INFORMATION

	U.S. DOT	RID/ADR	IMDG	IATA	IMO	Canada TDG
PROPER SHIPPING NAME:	Cartridge, Power Devices					
HAZARD CLASS:	1.4 C					
UN NO.:	UN 0276					
PACKING GROUP:	II					
HAZARD LABEL/PLACARD:	1.4C/1.4C Placard required over 1,001 pounds (454 kg)					
REPORTABLE QUANTITY:						
SPECIAL COMMENTS:	Forbidden on passenger aircraft, MAXIMUM 75 Kg. Cargo aircraft only. Requires cargo aircraft label 1.4C.					

15. REGULATORY INFORMATION

US FEDERAL

TSCA	The components of this product are listed on the Toxic Substance Control Act inventory.				
CERCLA:	Copper, R.Q.= 5000 lbs.; Nitroglycerin, R.Q. = 10 lbs. (No reporting is required if diameter of the pieces of metal is equal to or exceeds 100 micrometers (0.004 inches).				
SARA 313:	Copper, Lead and Lead compounds, Nitroglycerin, Aluminum (fume or dust)				
SARA 313 Hazard Class:	*Health*:	Acute – No Chronic - No	*Fire:* No	*Reactivity:* None	*Release of Pressure*: Yes
SARA 302 EHS List:	None of the components of this product are listed.				

*RQ = Reportable Quantity

STATE RIGHT-TO-KNOW STATUS

Component	*CA Prop. 65	New Jersey	Pennsylvania	Massachusetts	Michigan
Copper	Not listed	X	X	X	X
Polyethylene terphthalate	Not listed	Not listed	Not listed	Not listed	Not listed
Normal lead styphnate	X	Not listed	Not listed	X	Not listed
Basic lead styphnate	X	Not listed	Not listed	Not listed	Not listed
Nitrocellulose	Not listed	X	X	X	Not listed
Nitroglycerin	Not listed	X	X	X	Not listed
Potassium nitrate	Not listed	Not listed	X	X	Not listed
Aluminum	Not listed	X	X	X	Not listed

* "WARNING: This product contains detectable amounts of a chemical(s) known to the State of California to cause cancer and/or birth defects or other reproductive harm."

EUROPEAN REGULATIONS

Hazard Classification

Danger Symbol: E Explosive

Risk Phrases: R2 Risk of explosion by shock, friction, fire or other sources of ignition

Safety Phrases: S2 Keep out of reach of children.

German WGK Classification: Not known

CANADIAN REGULATIONS

DSL LIST: The components of this product are on the DSL or are exempt from reporting under the New Substances Notification Regulations.

IDL: Copper, Aluminum

WHMIS: This product is not subject to WHMIS. It is regulated as a Class 6 Explosive in Canada.

16. OTHER INFORMATION

REVISIONS: New International format, toxicology review – 1/1/03; 7/1/09 – changed emergency contract number and mailing address; 1/1/11 - review
PREPARED BY: Olin Corporation
OTHER: Additional information available from: www.winchester.com
NOTICE: THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BELIEVES THIS INFORMATION TO BE RELIABLE AND CURRENT AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS.