



CENTURY INTERNATIONAL ARMS, INC.

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MATERIAL SAFETY DATA SHEET

Product Name: Centerfire Cartridge

This Material Safety Data Sheet (MSDS) has been prepared in compliance with the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200. This product may be considered to be a hazardous chemical under the standard. (Refer to the OSHA classification in SEC I.) This information is required to be disclosed for safety in the workplace. The exposure to the community, if any, is quite different.

1. PRODUCT IDENTIFICATION

IN EVENT OF EMERGENCY
(Spill, Leak, Fire, Exposure, Accident)
CALL CHEMTREC DAY OR NIGHT
(800) 424-9300
International and Maritime
Telephone Number
+1 (703) 527-3887

MSDS Name: Centerfire Cartridge

SYNONYMS:
Small Arms Ammunition
Small Arms Military Surplus Ammunition

CHEMICAL FAMILY: Mixture
FORMULA: Not applicable/Mixture
USE DESCRIPTION: Centerfire Cartridge
OSHA HAZARD CLASSIFICATION: Explosive

Gr – Grain
SP – Soft point
FJ – Full jacket
HP – Hollow Point

2. COMPONENT-DATA

Product Composition

Consists of the following four components:

| | COMPONENT | PERCENT | PRODUCT | |
|--|-----------|---------|---------|--|
|--|-----------|---------|---------|--|

| | | | | |
|---|------------------|--------|-------------------|--|
| A | Projectile | 30-60% | Centerfire Bullet | |
| B | Brass Shell case | 30-55% | Brass | |
| C | Propellant | 6-15% | Smokeless Powder | |
| D | Primer | 3-5% | Centerfire Primer | |

All percent compositions specified below are based on the entire product.

2.1 Projectile

CAS or CHEMICAL NAME: Lead

CAS number: 7439-92-1

PERCENTAGE RANGE: 25-60%

HAZARDOUS PER 29 CFR 1910.1200: Yes (as dust or fume)

EXPOSURE STANDARDS: See 29 CFR 1910.1025

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 0.05 | 0.15 |
| CEILING | None | None |
| STEL: | None | None |

CAS OR CHEMICAL NAME: IRON

CAS number: 7439-89-6

PERCENTAGE RANGE; 0-33%

HAZARDOUS PER 29 CRF 1910.1200: Yes (as dust or fume)

EXPOSURE STANDARDS; As iron oxide fume

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 10 | 5 |
| CEILING | None | None |
| STEL: | None | None |

CAS or CHEMICAL NAME: Copper

CAS name: 7440-50-8

PERCENTAGE RANGE: 0-20%

HAZARDOUS PER 29 CFR 1910.1200: Yes (as dust or fume)

EXPOSURE STANDARDS:

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 10 | 5 |
| CEILING | None | None |
| STEL: | None | None |

CAS or CHEMICAL NAME: Zinc

CAS number: 7440-66-6

PERCENTAGE RANGE: 0-3.5%
HAZARDOUS PER 29 CFR 1910.1200: Yes (as dust or fume)
EXPOSURE STANDARDS: As zinc oxide

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 5 (respirable, 10 (total)) | 10 |
| CEILING | None | None |
| STEL: | None | None |

CAS or CHEMICAL NAME: Aluminum
CAS number: 7429-90-5
PERCENTAGE RANGE: 0-3.5%
HAZARDOUS PER 29 CFR 1910.1200: Yes (as dust or fume)
EXPOSURE STANDARDS:

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 5 (respirable, 10 (total)) | 10 |
| CEILING | None | None |
| STEL: | None | None |

CAS or CHEMICAL NAME: Antimony
CAS number: 74440-36-0
PERCENTAGE RANGE: 0.1-1.5%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 0.5 | 0.5 |
| CEILING | None | None |
| STEL: | None | None |

2.2 **Brass Shell Case**

CAS or CHEMICAL NAME: Copper (See Above)
CAS number: 7440-50-8
PERCENTAGE RANGE: 25-40%

CAS or CHEMICAL NAME: Zinc (See Above)
CAS number: 7440-66-6
PERCENTAGE RANGE: 13-17%

2.3 Propellant

CAS or CHEMICAL NAME: Nitrocellulose
CAS number: 9004-70-0
PERCENTAGE RANGE: 7-12%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None established

CAS or CHEMICAL NAME: Nitroglycerin
CAS number: 55-63-0
PERCENTAGE RANGE: 0.5-2%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 0.1 (skin) | 0.5 (skin) |
| CEILING | None | None |
| STEL: | None | None |

CAS or CHEMICAL NAME: Dibutyl phthalate
CAS number: 84-74-2
PERCENTAGE RANGE: 0.5-2%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 5 | 5 |
| CEILING | None | None |
| STEL: | None | None |

2.4 Primer

CAS or CHEMICAL NAME: Copper (See Above)
CAS number: 7440-50-8
PERCENTAGE RANGE: 0.5-2%

CAS or CHEMICAL NAME: Zinc (See Above)
CAS number: 7440-66-6
PERCENTAGE RANGE: 0.1-1%

CAS OR CHEMICAL NAME: Lead Styphnate
CAS number: 15245-44-0

PERCENTAGE RANGE: 0.1-1%
HAZARDOUS PER 29 CFR.1910.1200: Yes

EXPOSURE STANDARDS: See Lead (Above)

CAS or CHEMICAL NAME: Barium Nitrate

CAS number: 10022-31-8

PERCENTAGE RANGE: 0.1-1%

HAZARDOUS PER 29 CRF 1910.1200: Yes

EXPOSURE STANDARDS:

| | OSHA (PEL) mg/cubic-meter | ACGIH (TLV) mg/cubic-meter |
|---------|------------------------------|-------------------------------|
| TWA: | 0.5 | 0.5 |
| CEILING | None | None |
| STEL: | None | None |

3. SAFE HANDLING AND STORAGE

Do not take internally; avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, washing off with water.

Storage conditions:

Store in a cool, dry, well ventilated place, away from all sources of ignition.

Do not store at temperatures above: Not applicable

Do not subject to mechanical shock.

Product Stability and Compatibility:

Shelf life limitations: N/A

Incompatible materials for storage or transport: Acids, Class A & B explosives, Strong oxidizers and Caustics.

4. PHYSICAL DATA

APPEARANCE: Cylindrical, brass cartridge

FREEZING POINT: Not applicable

BOILING POINT: Not applicable

DECOMPOSITION TEMPERATURE: Not applicable

SPECIFIC GRAVITY: Not applicable

BULK DENSITY: Not applicable

pH @ 25C: Not applicable

VAPOR PRESSURE @ 25C: Not applicable

SOLUBILITY IN WATER: Not applicable

VOLATILES, PERCENT BY VOLUME: Not applicable

EVAPORATION RATE: Not applicable

VAPOR DENSITY: Not applicable

MOLECULAR WEIGHT: Not applicable

ODOR: None

CO-EFFICIENT OF OIL/WATER DISTRIBUTION: Not applicable

5. PERSONAL PROTECTIVE EQUIP

Personal Protection for routine use of product:

Respiratory Protection: Wear a NIOSH/MSHA approved respirator when exposed to fumes and/or dust in an enclosed or poorly ventilated area.

Ventilation: Local exhaust ventilation is recommended if significant dusting occurs. Otherwise, use general exhaust ventilation. Use explosion-proof ventilation.

Skin and eye protective equipment: Use safety glasses.

Equipment Specifications (When applicable):

Respirator Type: NIOSH/MSHA approved HEPA filter respirator.

Protective Clothing type (this includes: gloves, boots, apron)

6. FIRE & EXPLOSION HAZARD

Flammability Data:

Explosive: Yes

Flammable: Not applicable

Combustible: Not applicable

Pyrophoric: No

Flash Point: Not applicable

Auto Ignition Temperature: No data

Flammable limits at normal atmospheric temperature and pressure

(Percent volume in air): LEL – Not applicable

UEL – Not applicable

NFPA RATINGS: Not established

HMIS RATINGS:

Health: 0

Flammability: 2

Reactivity: 4

EXTINGUISHING MEDIA:

Flood area with water. If not water is available, use carbon dioxide, dry chemical or earth. If the fire reaches the cargo, withdraw and let fire burn.

FIRE FIGHTING TECHNIQUES AND COMMENTS:

See section 11 for protective equipment for fire fighting.

OTHER:

If fire reaches cargo, do not fight, evacuate all persons, including emergency responders from the area for 1500 feet in all directions.

7. REACTIVITY

Conditions Under Which This Product May Be Unstable

Temperatures Above: No data

Mechanical Shock or Impact: Yes (based on primer)

Electrical (Static) Discharge: Yes (based on primer)

Other: Cartridge may detonate if case is punctured or severely damaged.

Hazardous Polymerization: Will not occur

Incompatible Materials: Strong acids and caustics

Hazardous Decomposition Products: Nitrogen Oxides
Carbon Monoxide
Lead Oxides
Carbon Dioxide
Lead Dust/Fume

Summary of Reactivity:

| | | |
|------------------|---|-----|
| Explosive | : | Yes |
| Oxidizer | : | No |
| Pyrophoric | : | No |
| Organic Peroxide | : | No |
| Water Reactive | : | No |

8. FIRST AID

| | | |
|------------|---|--------------------------------|
| Eyes: | : | Not a likely route of exposure |
| Skin | : | Not a likely route of exposure |
| Ingestion | : | Not a likely route of exposure |
| Inhalation | : | Not a likely route of exposure |

9. TOXICOLOGY AND HEALTH

Routes of Absorption

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.

Warning Statements and Warning Properties:

Particles from firing may be harmful if inhaled.

Human Threshold Response Data:

Odor Threshold: No available data

Irritation Threshold: No available data

Immediately Dangerous to Life or Health: The IDLH concentration has not been established.

SIGNS, SYMPTOMS AND EFFECTS OF EXPOSURE

Inhalation:

Acute: Inhalation of lead dust or metal fume may cause irritation to nose, throat, upper respiratory tract and lung. The irritant effects may lead to bronchitis, headache, a fall in blood pressure, weakness, convulsions and collapse may occur. Severe poisoning may impair vision by damaging the optic nerve. The product is composed

of a solid projectile. It is judged that the physical nature of the product, and its use would preclude inhalation of a sufficient amount of lead and the development of these symptoms.

Chronic: Chronic inhalation of lead dust or metal fume may cause damage to central and peripheral nerves, blood, kidneys and the fetus. Male reproductive function may be impaired. Damage to nerves can result in reduction in motor nerve and muscle function. Anemia may result due to interference by lead of hemoglobin synthesis. Lead has been identified as an animal carcinogen; it may produce cancer in humans. Chronic exposure may lead to lead poisoning known as “plumbism”, causing gingival lead line and an accumulation in body tissues. The product is composed of a solid projectile. It is judged that the physical nature of the product, and its use would preclude inhalation of a sufficient amount of lead and the development of these symptoms.

Skin:

Acute: Lead can be absorbed through the skin to produce effects similar to those listed for acute inhalation exposure.

Chronic: Lead can be absorbed through the skin to produce effects similar to those listed under chronic inhalation exposure. The product is composed of a solid projectile. It is judged that the physical nature of the product, and its use would preclude skin absorption of a sufficient amount of lead and the development of these acute and/or chronic symptoms.

Eye:

Lead dust and fume can irritate the eyes with conjunctival redness and discharge. It is judged that This effect would not occur because of the physical nature of the product and its use.

Ingestion:

Acute: The effects of lead ingestion would be similar to those listed under acute inhalation exposure in addition of gastrointestinal tract irritation.

Chronic: The effects of lead ingestion would be similar to those listed under chronic

inhalation exposure. The product is composed of a solid projectile. It is judged that the physical nature of the product, and its use would preclude ingestion and the development of these acute and/or chronic symptoms.

Medical Conditions aggravated by Exposure:

Exposure to lead can aggravate anemia, cardiovascular and respiratory disease. There are not Medical conditions known to be aggravated by exposure to this product, due to its physical nature and use.

Interactions with other Chemicals which enhance toxicity

There are no chemicals known to enhance the toxicity of the product.

Animal Toxicology:

Acute Toxicity:

Inhalation LC 50: No available data

Dermal LD 50: No available data

Oral LD 50: No available data

Irritation: Not a skin or eye irritant

ACUTE TARGET ORGAN TOXICITY:

Lead dust and fume can cause damage to central nervous system, blood, lungs and eyes.

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). It is judged that the low concentration of nitroglycerin and the physical nature of the product would preclude the occurrence of these symptoms from exposure of this product.

Ingestion of large doses of soluble barium compounds can cause cyanosis, skeletal muscle paralysis, respiratory arrest, irregular heartbeat and hypertension. This product is composed of a finished and the cartridge primer is completely sealed. Ingestion of the product in its final form is unlikely.

If inhaled, zinc fumes can cause an influenza type reaction known as metal fume fever. Symptoms of this reaction may include metallic taste, runny nose, nausea, fever and chills. These effects usually disappear after 24 hours. It is judged that the physical nature of the product, the low percentage of zinc in the product, and its use would preclude the development of metal fume fever.

CHRONIC TARGET ORGAN TOXICITY:

Inhalation of lead can cause damage to the blood, central and peripheral nervous systems and kidney. Lead inhibits the production of hemoglobin, the material in the blood which carries oxygen. Anemia may result. Lead also causes damage to peripheral nerves resulting in a decrease in motor nerve and muscle function. The product is composed of a solid projectile. It is judged that the physical nature of the product and its use would preclude the development of these effects.

Inhalation of iron dust or fume has been shown to cause benign pneumoconiosis known as siderosis. This condition is characterized by deposition of iron in the lungs without subsequent fibrotic changes or impairment of lung function. The physical nature of the product, the low percentage of iron in the product, and its use would preclude the development of siderosis.

Inhalation of aluminum dust or fume has produced lung fibrosis in laboratory animals. It is judged that the physical nature of the product, the low percentage of aluminum in the product, and its use would preclude the development of lung fibrosis.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:

Lead has been shown to affect fetal development and reduce male reproductive function. Lead crosses the placenta and may affect the fetus causing birth defects, mental retardation, behavioral disorders, and death during the first year of childhood. The product is composed of a solid projectile. It is judged that the physical nature and use of the product would preclude the development of these effects.

CARCINOGENICITY:

This product is not known or reported to be carcinogenic by any reference source including IRAC, OSHA, NTP or EPA.

Lead is classified as a carcinogen by IARC. Based on the physical nature of the product and its Use, it is judged that the risk of cancer is not significant from exposure to the product.

MUTAGENICITY:

This product is not known or reported to be mutagenic.

AQUATIC TOXICITY:

The LC 50 of lead (48 hours) to bluegill (*Lepomis macrochirus*) is reported to be 2-5mg/l.

Fish are unaffected by nitrocellulose at concentrations of 1000 mg/l.

Barium Nitrate:

The lethal concentration of barium nitrate toward stickleback at 15-18 C has been reported as 400 mg/l as barium or 760 mg/l as barium nitrate. The average survival times for higher

concentrations were one week at 500 mg/l, four days at 1000 mg/l, two days at 2500 mg/l, and only one day at 3000 mg/l, all as barium. It has been found that the maximum concentration of barium nitrate that did not affect fish was 25 mg/l. In Lake Huron water at 12 C, 5 mg/l had no effect on rainbow trout, bluegill sunfish, or the sea lamprey during a 24 hour exposure.

10. TRANSPORTATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL

DOT Description from the Hazardous Materials Table 49 CFR 172.101: Land (U.D. Dot): Cartridges, Small Arms (Other than Blanks), 1.4S, UN0012, PGII

WATER (IMO): Same as above.

AIR (IATA/ICAO): Same as above.

Hazard Label/Placard: None Required.

Reportable Quantity: Not applicable (Per 49 CFR 172.101, Appendix).

Emergency Guide No: 114

Special Comments: May be reclassified domestically as an ORM-D if appropriately packaged per 49 CFR 173.230.

11. SPILL AND LEAKAGE

For all transportation accidents, call CHEMTREX at (800) 424-9300
In Washington, D.C. 483-7616
Outside Continental USA (202) 483-7616

Reportable Quantity: (Per 40 CFR 302.4) as nitroglycerine 10 lbs., dibutyl phthalate 10 lbs.,
Antimony 5000 lbs.

Spill Mitigation Procedures:

Evacuation procedures must be placed into effect. Evacuate all non-essential personnel.
Hazardous concentrations in air may be found in local spill area and immediately downwind.
This product does represent an explosion hazard from heat, shock, friction, a static discharge, etc.
Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

Air-Release: Not applicable.

Water-Release: Handle as described in land spill.

Land Spill: Do not place materials back in their original containers. Containerize and label all
spill materials properly. Decontaminate all clothing and the spill area using soap

Solution and flush with large amounts of water. Evacuate all non-essential
Personnel, shut off all ignition sources, no flares, smoking or flames in hazard area.

Spill Residues:

Dispose of per guidelines under paragraph 12, Waste Disposal.

Personal Protection for Emergency Spill and Fire-Fighting Situations:

No extra protection required beyond that listed in paragraph 5 (In case of fire, use normal fire
fighting equipment).

Protection concerns must also address the potential of the physical characteristic of this product
as explosive.

12. WASTE DISPOSAL

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40

CRF.261 and would have the following EPA hazardous waste number: D0003.

If this product becomes a waste, it will be hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.

Other: Deactivation

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE TUSE 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 REGULATION REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NON-HAZARDOUS WASTES.

13. ADDITIONAL REG STATUS

Toxic Substances Control Act:

The components of this product are listed on the Toxic Substance Control Act inventory.

California Safe Drinking Water and Toxic Enforcement Act of 1986 – Proposition 65:

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.

Superfund Amendments and Reauthorization Act Title III:

Hazard Categories, per 40 CFR 370.2

Health: None

Physical: Sudden release of pressure

Emergency Planning and Community right to know, per 40 CFR 355.APP A:

Extremely Hazardous Substance – Threshold Planning Quantity: None established.

Supplier Notification Requirements, Per 50 CFR 372.45: None established.

14. MAJOR REFERENCES

1. Friberg, L., F.F. Nordberg, and V.B. Vouk, eds., Handbook on the Toxicology of Metals, Vol. II, Elsevier, New York, 1986.
2. Lee, Cheng-Chun, et al., Mammalian Toxicity of Munition Compounds: Phase I. Acute Oral Toxicity, Primary Skin and Eye Irritation, Dermal Sensitization, and Disposition and Metabolism, NTIS Report (ADBO11150), National Technical Information Services, Springfield, VA. Report No.1, July 22, 1975.

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING,

OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. WE BELIEVE THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS.