

Safety Data Sheet**Section 1: Identification**

Product Name: CARTRIDGE, Power Device
Product Form: Threaded metal case hermetically sealed containing gas generating energetic materials
Synonyms: Pyrotechnic Actuator, Actuating Cartridge, Fire extinguisher actuator.
Product Part Numbers: M13083-5, M13083-45, M30903823, M30903850, M13083-10, M30900400, M30903824, M30903920, M13083-25, M30903819, M30903849, M30903824-1
UN Number: UN 0323

Intended Use of the Product

Recommended use: Used in aircraft to open hermetic seals in pressurized fire extinguishers

Details of the supplier of the safety data sheet

Manufacturer: AMETEK Ameron, LLC. dba MASS Systems
4750 Littlejohn St.
Baldwin Park, California 91706 – U.S.A
Telephone (Information): 626-337-4640
Website: ametek.com; ameronglobal.com

Emergency telephone number

Manufacturer: 800-255-3924

Section 2: Composition/Information on Ingredients

Hazardous Mixtures or Constituents	Chemical Sampling Information CAS	OSHA PEL Permissible exposure limits	ACGIH TLV Threshold Limit Values	Other Limits Recommended	% (Approx.)
RDX Cyclotrimethylenetrinitramine	121-82-4	1.5mg/m ³	1.5mg/m ³	1.5mg/m ³ NIOSH TWA 3.0 mg/m ³ STEL; skin	75
Zirconium	7440-67-7	5 mg/m ³	10 mg/m ³		25
Potassium Perchlorate	7778-74-7	N/A			< 1

Component Information/Information on Non-Hazardous Components

Note: these ingredients are present at less than 0.72 grams in a hermetically sealed capsule.
This product is considered to be hazardous under 29 CFR 1910.1200 (Hazard Communication).

Section 3 - Hazard Identification

Emergency Overview

Product is a metal case with various electrical connectors. When activated, this product may eject small metal fragments propelled by rapidly expanding gas. Under normal conditions of operation and storage, no adverse health effects are expected. When activated, a small quantity of irritating and toxic fumes and gases are released. However, in normal operation, these fumes are diluted by a large volume of extinguishing agent (such as Halon) and pose minimal risk.

Potential Health Effects: Eyes

No adverse effects expected under normal conditions of operation. While exposure is unlikely, detonation fumes may irritate the eyes. If uninstalled product is activated, small metal fragments are ejected that could damage the eyes.

Potential Health Effects: Skin

No adverse effects expected under normal conditions of operation. While exposure is unlikely, detonation fumes may irritate the skin. If uninstalled product is activated, small metal fragments are ejected that could damage the skin.

Potential Health Effects: Ingestion

Ingestion is not an expected exposure route under normal conditions of operation

Potential Health Effects: Inhalation

Inhalation is not an expected exposure route under normal conditions of operation. While exposure is unlikely, detonation fumes may irritate the respiratory tract

Section 4: First-Aid Measures

First Aid: Eyes

For any eye exposure, flush eyes with plenty of cool water for at least 15 minutes. Seek medical attention if irritation develops or persists. If an eye is struck by a shrapnel fragment, seek immediate medical attention.

First Aid: Skin

Wash skin immediately with soap and water. Seek medical attention if irritation develops or persists. If skin is injured by a shrapnel fragment, seek immediate medical attention.

First Aid: Ingestion

Ingestion is highly unlikely. If gastrointestinal irritation develops after exposure to detonation fumes, seek medical advice.

First Aid: Inhalation

Remove affected person to fresh air. If irritation or difficult breathing develops or persists, seek medical attention.

Section 5: Fire-Fighting Measures

Flash Point: NA
Upper Flammable Limit (UFL): NA
Auto Ignition: ≥ 400 °F

Method Used: NA
Lower Flammable Limit (LFL): NA
Flammability Classification: NA

General Fire Hazards

Actuator devices can be detonated by fire or high heat, electricity, and high radiofrequency energy.

Hazardous Combustion Products

Potassium, and zirconium oxides and chlorides, carbon dioxide and monoxide.

Extinguishing Media

DO NOT FIGHT FIRES INVOLVING EXPLOSIVES!

If possible, without placing persons in harm, keep fire from reaching explosives. Move product away from fire area if it has not yet been exposed to heat. Isolate area. Guard against intruders. Consult the 2008 or later Emergency Response Guidebook, ERG Guide 114 for further details.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective gear, including self-contained breathing apparatus.

Section 6 - Accidental Release Measures

Containment Procedures

Not applicable under normal conditions of operation.

Clean-Up Procedures

Carefully pick up devices. Repack undamaged devices for storage and separate visibly damaged devices for proper disposal.

Evacuation Procedures

Keep unnecessary personnel away.

Special Procedures

Damaged actuators should be electrically detonated under controlled conditions by properly trained personnel

Section 7 - Handling and Storage

Handling Procedures

Uninstalled actuators should only be handled by personnel trained to handle explosive devices. Static grounding is recommended when handling unshunted devices.

Storage Procedures

Store in accordance with the specification of Subpart K, ATF: Explosives Law and Regulations (27 CFR 55.201-55.219). regarding safe handling and storage of explosive devices. At minimum, store in a dry area at temperature range of 50 to 85 °F (10 to 30 °C). Keep away from flammable materials and sources of heat and flame. Prevent static discharges

Section 8 - Exposure Controls / Personal Protection

A: Component Exposure Limits

RDX, Cyclotrimethylenetrinitramine (121-82-4)

ACGIH: RDX – Skin TWA 1.5 mg/M³
OSHA: RDX – Skin TWA 1.5 mg/M³
NIOSH: RDX - 0.05 mg/m³ TWA

Zirconium (7440-67-7)

ACGIH: 5 mg/m³ TWA
10 mg/m³ STEL
OSHA: 5 mg/m³ TWA
10 mg/m³ STEL
NIOSH: 5 mg/m³ TWA
10 mg/m³ STEL

Engineering Control Measures:

Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Natural ventilation should be adequate under normal use conditions.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Safety glasses with side shields

Personal Protective Equipment: Skin

Gloves are not ordinarily required

Personal Protective Equipment: Respiratory

Respiratory protection is not ordinarily required

Personal Protective Equipment: General

Use good industrial hygiene practices when handling the actuating cartridge

Section 9 - Physical & Chemical Properties

Appearance: Metal case with various electrical connectors

Odor: None

Physical State: Manufactured device

pH: NA

Vapor Pressure: NA

Vapor Density: NA

Boiling Point: NA

Melting Point: NA

Solubility (H₂O): NA

Specific Gravity: NA

Section 10 - Chemical Stability & Reactivity Information

Chemical Stability

Actuators are stable under normal conditions of operation

Chemical Stability: Conditions to Avoid

Fire/heat, unintentional application of electricity, and high radiofrequency energy

Incompatibility

Do not attempt to open or remove internal sealed capsule containing explosive material

Hazardous Decomposition

Potassium, and zirconium oxides and chlorides, carbon dioxide and monoxide

Hazardous Polymerization

Will not occur

Section 11 - Toxicological Information

Acute and Chronic Toxicity

A: General Product Information

The chemicals contained in the actuator are hermetically sealed and pose no hazard under normal conditions of operation and storage. When activated, a small quantity of irritating and toxic fumes and gases are released. However, in normal operation, these fumes are diluted by the large volume of extinguishing agent (such as Halon) and pose minimal risk.

B: Component Analysis - LD50/LC50

RDX (121-82-4)

Oral LD50 (rat):	100 mg/kg
Oral LD50 (mice):	59 mg/kg

Rats exposed to an oral dose of 40 mg/kg/day for six months developed myocardial degeneration, blood disorders, renal dysfunction, enlarged adrenals and cataracts.

Workers exposed to oral doses of the component RDX (unspecified amounts) have experienced convulsions, disorientation, nausea, restlessness, muscle twitching and lethargy.

Component Carcinogenicity

RDX (121-82-4)

The substance has low to moderate toxicity with a possible human carcinogen classification.^[48] it is classified as a Group C (possible human) carcinogen by the EPA.

Zirconium (7440-67-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

No information is available for product. Due to physical form of actuator, and small quantity of chemicals, environmental impact is negligible.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

RDX (121-82-4)

Test & Species Conditions

10-d LC50 marine amphipods 86 µmol kg(-1) ww failed to result in significant mortality

10-d LC50 sheepshead minnow 9.6 mg kg(-1) (34.9 µmol kg(-1)) wet weight

Associated mean body residue (3 mg kg(-1) or 14 µmol kg(-1) ww) resulted in no significant mortality for exposed minnows.

Environmental Fate

No information is available for product.

Section 13 - Disposal Considerations

US EPA Waste Number & Descriptions

A: General Product Information

Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

B: Component Waste Numbers

RDX Cyclonite (121-82-4)

RTECS	XY9450000
EPA hazardous waste	No data
OHM/TADS	No data

Disposal Instructions

Units may only be disposed of in accordance with all applicable federal Resource Conservation and Recovery Act (RCRA), state and local regulations, after complete functioning by test-firing and /or thermal treatment in an approved, permitted facility. Ash residues may be metal bearing.

Section 14 - Transportation Information

US DOT Information

Shipping Name: Actuating Cartridge, Power Device
UN/NA #: UN0323 **Hazard Class:** 1.4s
Required Label(s): Explosives 1.4s

TDG Information

Shipping Name: Actuating Cartridge, Power Device
UN/NA #: UN0323 **Hazard Class:** 1.4s
Required Label(s): Explosives 1.4s

IATA Information

Shipping Name: Actuating Cartridge, Power Device
UN #: UN0323 **Hazard Class:** 1.4s
Required Label(s): Explosives 1.4s

ICAO Information

Shipping Name: Actuating Cartridge, Power Device
UN #: UN0323 **Hazard Class:** 1.4s
Required Label(s): Explosives 1.4s

IMDG Information

Shipping Name: Actuating Cartridge, Power Device
UN #: UN0323 **Hazard Class:** 1.4s
Required Label(s): Explosives 1.4s

ADR Information

Shipping Name: Actuating Cartridge, Power Device
UN #: UN0323 **Hazard Class:** 1

RID Information

Shipping Name: Actuating Cartridge, Power Device
UN #: UN0323 **Hazard Class:** 1



Note: These cartridges may be shipped as 1.4s (UN0323) when packaged appropriately.

Section 15 - Regulatory Information

US Federal Regulations

311/312 HAZARD CATEGORIES:

Fire: Yes Immediate: Yes Pressure: No
 Reactivity: No Delayed: No

State Regulations

A: Component Analysis - State

The following components appear on one or more of the following state hazardous substances list:

Component	CAS	CA	MA	MN	NJ	PA	RI
RDX	121-82-4	Yes	Yes	Yes	Yes	Yes	Yes
Zirconium	7440-67-7	Yes	Yes	Yes	Yes	Yes	Yes
Potassium perchlorate	7778-74-7	No	Yes	No	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
 WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects

Canadian WHMIS Information

A: General Product Information

This product has been classified in accordance with the Canadian Controlled Products Regulations (CPR) and this MSDS contains all of the information required by the CPR.

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
RDX	121-82-4	1.5 mg/m3
Zirconium	7440-67-7	1 % (English Item 1733, French Item 1736)

WHMIS Classification: PIC.WHMIS Class D2 D2A, D2B

Additional Regulatory Information

A: General Product Information

All components are on the TSCA Inventory, are exempt from the TSCA inventory requirement, or are otherwise not required to be listed on the TSCA Inventory.

B: Component Analysis – Inventory

Component	CAS #	TSCA	CAN	EEC
RDX	121-82-4	Yes	DSL	EINECS
Zirconium	7440-67-7	Yes	DSL	EINECS
Potassium perchlorate	7778-74-7	Yes	DSL	EINECS

Section 16 - Other Information

Other Precautions

Keep unit shunted until connection to circuitry. Never attempt to disassemble, machine, or otherwise modify unit or physical injury hazard may result.

The information included herein, is believed to be correct, but does not purport to be all-inclusive and shall be used only as a guide in conjunction with approved safety procedures and all applicable regulatory requirements

Former DOT Proper Shipping Name / Hazard Class

Detonators, Class C Explosives / Class C Explosives

Other Information

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State and local laws.

MSDS History

Initial Release: Rev. N/C, Dated 2-15-05

Revision 1: Rev. 1, Dated 8-5-05

Revision 2: Rev. 2, Dated 7-9-07

Revision 3: Rev. 3, Dated 7-24-08

Revision 4: Rev. 4, Dated 5-20-11

Revision 5: Rev. 5, Dated 9-27-13

Revision 6: Rev. 6, Dated 7-14-14

Revision 7: Rev. 7, Dated 7-21-14

End of MSDS