



Box 1794 · Appleton, WI 54912 · (920) 735-6242 · Fax (920) 735-6245 · asp-usa.com

SDS

Safety Data Sheet

AAA & AA Lithium Batteries

1. PRODUCT & COMPANY IDENTIFICATION

Manufacturer Name	Armament Systems and Procedures, INC
Address	2511 E Capitol Drive, Appleton, WI 54911
Telephone No	(920) 735-6242
Date	21 JAN 15
Model	AAA & AA
Product Name	Lithium Metal Cell
Chemical Name	Lithium and Iron Disulfide (Li-FeS ₂ cell)
Product Code	FR6; FR03
Recommended Use	Power supply

2. HAZARDS IDENTIFICATION

GHS Classification

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Label Elements

Symbols/Pictograms	None
Signal word	None
Hazard Statements	None
Precautionary Statements	
Prevention	None
Response	None
Storage	None
Disposal	None

Hazards not otherwise classified (HNOC)

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight (%)
Ethylene glycol dimethyl ether	110-71-4	5 – 10
Pyrite (FeS ₂)	1309-36-0	15 – 40
Steel	12597-69-2	15 – 40
Propylene carbonate	108-32-7	5 – 10
Aluminum	7429-90-5	5 – 10
Lithium	7439-93-2	3 – 7
Polypropylene	9003-07-0	1 – 5
Lithium Salt	7791-03-9	1 – 5

4. FIRST AID MEASURES

Description of first aid measures

General advice	No hazards which require special first aid measures.
Inhalation	Not an expected route of exposure.
Skin Contact	No special technical protective measures are necessary.
Eye contact	Not an expected route of exposure.
Ingestion	Rinse mouth. Get medical attention. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

No information available

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	No information available

Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors
Keep product and empty container away from heat sources of ignition
In the event of fire and/or explosion do not breathe fumes

Protective equipment and precautions of firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent)

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation, especially in confined areas
ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area)

Methods and material for containment and cleaning up

Pick up and transfer to properly labeled containers

Should not be released into the environment

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice
Ensure adequate ventilation, especially in confined areas
Keep away from heat, sparks, flame and other sources of ignition
Do not eat, drink or smoke when using this product

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place
Keep away from heat

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH	Denmark	European Union
Pyrite (FeS ₂) (CAS #: 1309-36-0)	TWA: 1 mg/m ³ Fe	-	-	TWA: 1 mg/m ³	-
Aluminum (CAS #: 7429-90-5)	TWA: 1 mg/m ³ respirable fraction	TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 15 mg/m ³ total dust (vacated) TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 5 mg/m ³ Al Aluminum	TWA: 10 mg/m ³ total dust TWA: 5 mg/m ³ respirable dust TWA: 5 mg/m ³ Al	TWA: 5 mg/m ³ TWA: 2 mg/m ³	-

Chemical Name	Latvia	France	Finland	Germany	Italy
Aluminum (CAS #: 7429-90-5)	TWA: 2 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 1.5 mg/m ³	TWA: 4 mg/m ³ TWA: 1.5 mg/m ³	-

Chemical Name	Poland	Portugal	Spain	Switzerland	Netherlands
Aluminum (CAS #: 7429-90-5)	TWA: 2.5 mg/m ³ TWA: 1.2 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 3 mg/m ³	TWA: 0.05 mg/m ³

Chemical Name	Norway	United Kingdom	Australia	Austria	Belgium
Pyrite (FeS ₂) (CAS #: 1309-36-0)	-	-	1 mg/m ³	-	-
Aluminum (CAS #: 7429-90-5)	TWA: 5 mg/m ³ STEL: 10 mg/m ³	STEL: 30 mg/m ³ STEL: 12 mg/m ³ TWA: 10 mg/m ³ TWA: 4 mg/m ³	10 mg/m ³ 5 mg/m ³	STEL: 20 mg/m ³ TWA: 10 mg/m ³	-

Appropriate engineering controls

Ensure adequate ventilation, especially in confined areas

Remove all sources of ignition

Individual protection measures, such as personal protective equipment

Respiratory protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Hand Protection No special technical protective measures are necessary

Eye/face protection No special technical protective measures are necessary

Skin and body protection Wear suitable protective clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Solid
Color	Silver
Odor	Odorless
Odor Threshold	Not determined
pH	Not determined
Melting point/freezing point	Not determined
Boiling point/boiling range	Not determined
Flash point	Not applicable
Evaporation rate	Not determined
Flammability (solid, gas)	Not flammable
Flammability Limit in Air	Not determined
Vapor Pressure	Not applicable
Vapor Density	Not determined
Density	Not determined
Relative density	Not determined
Bulk density	Not determined
Specific gravity	Not determined
Water solubility	Not determined
Partition coefficient (LogPow)	Not determined
Autoignition temperature	Not determined
Decomposition temperature	Not determined
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Explosive properties	Not an explosive
Oxidizing properties	Not determined

10. STABILITY AND REACTIVITY

Reactivity	Stable under recommended storage and handling conditions (see SECTION 7, handling and storage)
Chemical Stability	Stable under normal conditions
Possibility of Hazardous Reactions	None under normal processing
Conditions to avoid	Extremes of temperature and direct sunlight

Incompatible materials	None known based on information supplied
Hazardous Decomposition Products	None known based on information supplied

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation	Inhalation of vapors in high concentration may cause irritation of respiratory system
Eye Contact	Contact with eyes may cause irritation
Skin Contact	Substance may cause slight skin irritation Ingestion may cause irritation to mucous membranes

Information on toxicological effects

Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Iron (CAS #: 7439-89-6)	98.6 g/kg bw (rat)	-	-
Aluminum (CAS #: 7429-90-5)	LD50> 15900 mg/kg bw (rat)	-	LC50> 0.888 mg/L/4 h(rat)
Polypropylene (CAS #: 9003-07-0)	>5 g/kg	-	-

Skin Corrosion/irritation

Non-irritating to the skin

Serious eye damage/eye irritation

No eye irritation

Sensitization

No information available

Germ cell mutagenicity

No information available

Carcinogenicity

This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP

Reproductive toxicity

No information available

STOT – single exposure

No information available

STOT – repeated exposure

No information available

Aspiration hazard

No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Iron (CAS #: 7439-89-6)	-	-	> 100 mg/L/48h (Daphnia magna)
Aluminum (CAS #: 7429-90-5)	-	> 50 mg/L/96h	-

Persistence and degradability

No information available

Bioaccumulative potential

No information available

Mobility in soil

No information available

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes Disposal should be in accordance with applicable regional, national and local laws and regulations

Contaminated packaging Dispose of in accordance with federal, state and local regulations

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste Status
Aluminum 7429-90-5	Ignitable powder

14. TRANSPORT INFORMATION

Number of dangerous goods	/
UN Number	3090/3091
Packaging Mark	/
Packaging Method	/
Transport Attention	According to PACKING INSTRUCTION 968~970 of IATA DGR 59 th Edition for transportation, the special provision of 188 of IMDG (inc Amdt35-10). The Lithium metal batteries according to Section II/Section 1B PI 968, or Section II of PI 969~970 of the Dangerous Goods regulation 59 th Edition may be transported. The batteries should be securely packed and protected against short-circuits. Examine whether the package of the containers are together and tight before closed for transport. Move cargo without them falling, dropping or breaking. Prevent collapse of cargo piles and water from rain. The transport vehicle and ship must be cleaned and sterilized otherwise it is not allowed to assemble articles. During transport, the vehicle should prevent exposure to rain and high temperatures. For stopovers, the vehicle should be away from fire and heat sources. When transported by sea, the assemble place should keep away from bedrooms and kitchen, and isolated from the engine room, power and fire source. Under the condition of Road Transportation, the driver should drive in

	accordance with regulated route. Do not stop over in residential or congested areas.
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15. REGULATORY INFORMATION

Law Information:

ISO 11014-2009: Safety Data Sheet for chemical products – Content and order of sections.

Regulation (EC) No 1272/2008: Classification, Labeling and Packaging of Substances and Mixtures.

International Air Transport Association (IATA) Dangerous Goods Regulations, 59th Edition.

The International Maritime Dangerous Goods (IMDG) Code (inc Amdt35-10).

International Inventories

Component	AICS	DSL/NDL	EINECS/ELI NCS	ENCS	IECSC	KECL	PICCS	TSCA
Pyrite (FeS ₂) 1309-36-0 (15 – 40)	X	X	-	-	X	-	-	-
Iron 7439-89-6 (15 – 40)	X	X	X	-	X	X	X	X
Aluminum 7429-90-5 (5 – 10)	X	X	X	-	X	X	X	X
Lithium 7439-93-2 (3 – 7)	X	X	X	X	X	X	X	X
Polypropylene 9003-07-0 (1 – 5)	X	X	-	X	X	X	X	X
Lithium Salt (1 – 5)	X	X	X	X	X	X	-	X

“-” Not Listed

“X” Listed

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 – Threshold Values %
Aluminum – 7429-90-5	1.0

SARA 311/312 Hazard Categories

Does not apply

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional or state level pertaining to releases of this material.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

This product may contain substances regulated by state right-to-know regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Aluminum 7429-90-5	X	X	X
Lithium 7439-93-2	X	X	X

16. OTHER INFORMATION

Revision Note

Issue Date	21-Jan-2015
Revision Date	21-Jan-2015
Revision Note	Not applicable

Key or legend to abbreviations and acronyms used in the safety data sheet

TWA – TWA (time-weighted average)

STEL – STEL (Short Term Exposure Limit)

Ceiling – Maximum limit value

TSCA – United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL – Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS – European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS – Japan Existing and New Chemical Substances

IECSC – China Inventory of Existing Chemical Substances

KECL – Korean Existing and Evaluated Chemical Substances

PICCS – Philippines Inventory of Chemicals and Chemical Substances

AICS – Australian Inventory of Chemical Substances

Disclaimer

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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