

Ref. No: ZN-HW-4R25-PSDS-VI-APS PL

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PRODUCT SAFETY DATA SHEET

This PSDS document refers to batteries as a consumer product. Under the Global Harmonized System the batteries are considered "articles" and are exempted from SDS classification criteria from and the GHS labelling. The following document is supplied as a feedback to requests concerning battery use, regulatory compliance and safety of use.

1. PRODUCTS AND COMPANY IDENTIFICATION

Product name: Zinc Manganese HI WATT	
IEC Designation	Voltage (V)
4R25	6

Advanced Power Solutions

Nieuwe Gentsesteenweg 21
1702 Groot-Bijgaarden
Belgium

2. HAZARDS IDENTIFICATION

Most Important Hazardous

Adverse Human Health

Effects:

When the leaked liquid adheres to the skin, it may cause the damage of the skin. When it is gotten in eye, it may cause the damage of eye such as losing sight.

Physical And Chemical Hazard:

There is the risk of explosion if batteries are disposed in fire, heated above 100 degree C. Stacking or jumbling batteries may cause external short circuits, heat generation and explosion.

Specific Hazards:

Not Applicable.

Class Name Of Hazardous Chemicals:

Not Applicable.

3. COMPOSITION/IMFORMATION ON INGREDIENTS

Substance name: Zinc Manganese Battery

Component	Content %	CAS No.
<Positive electrode>		
Manganese dioxide	28	1313-13-9
Carbon	10,4	7782-42-5
<Negative electrode>		
Zinc	18,8	7440-66-6
<Electrolyte>		
Zinc Chloride	5,75	7646-85-7
Ammonium Chloride	0.70	12125-02-9
Water	16,6	-

4. FIRST AID MEASURES (IF LEAKED SOLUTION WILL CONTACT)

<u>Skin Contact:</u>	Wash the affected area under tepid running water using a mild soap. If appropriate procedures are not taken, this may cause sores on the skin. Get medical attention if irritation develops or persists.
<u>Eye Contact:</u>	Do not rub eyes. Wash immediately with large amount of clean water such as tap water 15 minutes or more then receive the ophthalmologist's treatment promptly. It may cause such as losing sight when the right procedure is not taken.
<u>Ingestion:</u>	Wash in the mouth immediately with large amount of clean water and make the sufferer drink a lot of water. Arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.
<u>Inhalation of electrolyte fume:</u>	Remove to fresh air immediately. Take a medical treatment

5. FIRE FIGHTING MEASURES

<u>Extinguishing Media:</u>	Dry chemical, carbon dioxide, great deal of water.
<u>Specific Fire-Fighting Methods:</u>	Be sure on the windward to extinguish the fire, since vapor from burning batteries may make eyes, nose and throat irritate. Wear the respiratory protection equipment in some cases.

6. ACCIDENTAL RELEASE MEASURES (IN CASE OF ELECTROLYTE LEAKAGE FROM THE BATTERY)

<u>Health Considerations and Protective Equipment:</u>	Wear proper protective equipment.
<u>Environmental Precautions:</u>	Prevent spills from entering sewers, watercourses.
<u>Spill Clean-Up Procedures:</u>	Collect material to minimize dust generation; use wet mop, damp sponge. Place collected material into a suitable container for disposal.

7. HANDLING AND STORAGE

Handling

Technical No exposure limits exist for the battery

Measures:

Precaution: When packing the batteries, do not allow battery terminals to contact each other, or contact with electrically conductive materials. Be sure to pack batteries by providing partitions in packaging boxes, or in separate plastic bags to avoid they are mixed together. Use strong material for packaging boxes to avoid damage by vibration, impact, dropping and stacking during transportation. Do not recharge batteries. Do not deform batteries. Do not mix different types of batteries. Do not solder directly onto batteries.

Storage

Storage Do not let water penetrate into packaging boxes during their storage and transportation. Do not store the batteries in the high temperature exceeding 35 degree C, under direct sunlight or near heat source. Also avoid high humidity. Be sure not to expose the batteries to condensation, water drop or not to store them under frozen condition

Safe Packaging Carton boxes, Wooden boxes

Materials:

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION (IN CASE OF ELECTROLYTE LEAKAGE FROM THE BATTERY)

Engineering Measures: Make available in the work area and storage place emergency shower and eyes wash

Occupational Exposure Limits (OELs): Not specified in ACGIH and OSHA

Protective Equipments

Respiratory Protection: For most condition no respiratory protection

Hand Protection: Safety gloves.

Eye Protection: Safety glasses with side shields must be worn when handling this product

Skin and Body Protection: To prevent any contact, wear impervious clothing such as boots or whole body suits as appropriate

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Style Appearance:	Solid
Colour:	Depend on the design
Odour:	Odourless~Characteristic odour
pH:	Not Applicable
Specific temperatures /Temperature range at which changes in physical state occur:	Not Applicable
Flash Point:	Not Applicable
Explosion Properties:	No Data
Specific Gravity (g/cm ³):	No Data
Solubility:	Insoluble
Voltage:	4,5 Volts

10. STABILITY AND REACTIVITY (PHYSICAL HAZARD)

Since batteries utilize a chemical reaction they are actually considered a chemical product. As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

<u>Stability:</u>	Stable under normal conditions
<u>When batteries are short-circuited:</u>	There is the possibility that stacking or jumbling batteries cause short circuits, heat generation, leakage or explosion
<u>When batteries are recharge:</u>	Risk of swelling leakage or explosion, contents may protrude
<u>When batteries are heated or disposed in fire:</u>	Risk of leakage or explosion
<u>When batteries are disassembled:</u>	Risk of short circuits. Electrolyte may cause skin itching
<u>Reactivity:</u>	Stable under normal conditions
<u>Hazardous Decomposition Products:</u>	No information

11. TOXICOLOGICAL INFORMATION

Battery is not harmful as its ingredients are in a hermetically sealed state.

In case of the worn out battery was disposed in land, the battery case may be corroded, and leak electrolyte.

12. DISPOSAL CONSIDERATIONS

When the battery is worn out, dispose of it under the ordinance of each local government or the law issued by relating government

13. TRANSPORT INFORMATION

During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to condensation. During the transportation do not allow packages to be dropped or damaged.

14. REGULATORY INFORMATIONS

- EU Battery Directive (2006/66/EC, version 2018) <http://data.europa.eu/eli/dir/2006/66/2018-07-04>
- Regulation (EC) No, 1907/2006 on the Registration, Evaluation, Authorization of Chemicals (REACH) (current version 1/5/2022) <http://data.europa.eu/eli/reg/2006/1907/2022-05-01>

15. OTHER INFORMATION

References:

- IATA Dangerous Goods Regulations 63rd Edition (2022)
- IMO International Maritime Dangerous Goods 2020 Edition