



MATERIAL SAFETY DATA SHEET

according to Regulation (EC) No 1907/2006 and its updates

Revision: 12

Revision date: 05.09.2019

Printing date: 05.09.2019

ZINC-AIR SALINE PRIMARY BATTERY

0. EXPLANATORY NOTE

Iskra produces zinc-air saline batteries for electric fences. The nominal open-circuit voltage for zinc air-alkaline battery is 1,5 V per cell and Iskra produces batteries with voltage from 1,5 to 9 V and capacity from 30 to 130 Ah.

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

PRODUCT NAME: Zinc-air saline primary battery.
PRODUCT TYPES: AS4, 5AR40, 6AS4 35, 6AS4 55, 6AS4 55_35, 6AS4 65, 6AS6 70, 6AS6 90, 6AS6 90_70, 6AS6 100, 6AS6 130, 6AS6 130_100.
VOLTAGE: 1,5 V – 9 V
ELECTROCHEMICAL SYSTEM: O₂ / NH₄Cl / Zn

1.2 Relevant identified uses of the substance and uses advised against

Primary energy source.

1.3 Details of the supplier of the safety data sheet

Iskra, d.o.o.	BU Šentvid
Stegne 21	Šentvid pri Stični 108
1000 Ljubljana	SI-1296 Šentvid pri Stični
Slovenia	Slovenia
e-mail: info@iskra.eu	Tel.: + 386 1 780 08 00
http://www.iskra.eu	e-mail: info@iskra.eu

1.4 Emergency telephone

Emergency information services / official advisory body

112 (Slovenia)

Telephone number of the company in case of emergencies

+ 386 1 780 08 00 (Iskra BU Šentvid telephone number)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

Not a hazardous substance according to Regulation (EC) No. 1272/2008 (CLP) and its updates.

2.2 Labels elements

The product does not need to be labelled in accordance with EC directives.

2.3 Other hazards

Incorrect handling of the batteries may lead to an accidental release of liquid, overheating or explosion and cause injury to people or damage to equipment. Contents of an open battery can cause serious chemical burns of mouth, esophagus, gastrointestinal tract, respiratory irritation, skin and eye irritation and chemical burns on skin or eye.



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3. COMPOSITION/INFORMATION ON INGREDIENTS

IMPORTANT NOTE: The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful:

MATERIAL OR INGREDIENT	HAZARD CATEGORIES	HAZARD STATEMENTS	HAZARD SYMBOLS	PEL (OSHA)	TLV (ACGIH)	% / wt.
Ammonium chloride [NH ₄ Cl] CAS No. 12125-02-9	Acute Tox. 4 Eye irrita. 2	H302 H319		None listed	10 mg/m ³ TWA 20 mg/m ³ STEL	12-14
Zinc chloride [ZnCl ₂] CAS No. 7646-85-7	Acute Tox. 4 Skin Corr. 1B STOT SE 3 Aquatic Acu. 1 Aquatic Chr. 1	H302 H314 H335 H400 H410	 	1 mg/m ³ TWA (fume)	1 mg/m ³ TWA 2 mg/m ³ STEL	8-10
Calcium chloride dihydrate [CaCl ₂ *2H ₂ O] CAS No. 10035-04-8	Eye Irrit. 2A	H319		None listed	None listed	1-2
Activated carbon [C] CAS No. 7440-44-0	Eye Irrit. 2B STOT SE 3	H320 H335		5 mg/m ³ (respirable)	10 mg/m ³ (total)	5-7
Manganese dioxide [MnO ₂] CAS No. 1313-13-9	Acute Tox. 4	H302 H332		5 mg/m ³ ceiling (as Mn)	0,2 mg/m ³ TWA (as Mn)	0-3
Zinc [Zn] CAS No. 7440-66-6	Aquatic Acu. 1 Aquatic Chr. 1	H400 H410		15 mg/m ³ TWA PNOR* (total dust) 5 mg/m ³ TWA PNOR* (respirable fraction)	10 mg/m ³ TWA PNOC* (inhalable particulate) 3 mg/m ³ TWA PNOC* (respirable particulate)	14-23

NO HAZARDOUS INGREDIENT	PEL (OSHA)	TLV (ACGIH)	% / wt.
Plastic	None established	None established	11-16
Water, paper and other	None established	None established	Balance

*PNOR: Particulates not otherwise regulated.

*PNOC: Particulates not otherwise classified.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice: For consumer use, adequate hazard warnings are included on both the package and on the battery. Potential for exposure should not exist unless the battery leaks, is exposed to high temperatures, is accidentally swallowed or is mechanically, physically, or electrically abused.

Inhalation: Not anticipated. Respiratory and eye irritation may occur if fumes are released due to heat or an abundance of leaking batteries. Remove to fresh air. Contact physician if irritation persists.

Skin contact: Irritation, including caustic burns/injury, may occur following exposure to a leaking battery. Irrigate exposed skin with copious amounts of clear, tepid water for at least 15 minutes. If irritation, injury or pain persists, consult a physician.



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- Eye contact:** Irritation, including caustic burns/injury, may occur following exposure to a leaking battery. If battery is leaking and material contacts eyes, flush with copious amounts of clear, tepid water for 30 minutes. Contact physician at once.
- Ingestion:** Not anticipated. Irritation, including caustic burns to the internal/external mouth areas, may occur following exposure to a leaking battery. If mouth area irritation/burning have occurred, rinse the mouth and surrounding area with clear, tepid water for at least 15 minutes. If irritation injury or pain persists, consult a physician.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Any extinguishing media will be effective.

5.2 Special hazard arising from the substance

The product is not flammable.

In fires involving large quantities of product, use self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Notify safety personnel of large spills. Wear self-contained breathing apparatus to avoid inhalation, eye or skin contact of hazardous decomposition products.

6.2 Environmental precautions

Keep spill away from drains, surface, ground water and soil.

6.3 Methods and material for containment and cleaning up

Battery materials should be collected in a leak-proof container. The waste matter produced must be treated in accordance with current legislation.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid mechanical or electrical abuse. Do not short-circuiting or install incorrectly (respect the polarity + and -). Batteries may explode, pyrolyze or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. Replace all batteries in equipment at the same time. Keep batteries out of children's reach. Do not mix different types of batteries. Do not dismantle the batteries. Do not throw batteries into a fire or incinerate.

Zinc-air saline batteries need oxygen from ambient for operation. Do not seal the battery in an airtight or watertight container. This could result in blockage of air access holes and premature battery failure. Batteries normally evolve hydrogen which, when combined with oxygen from the air, can produce a combustible or explosive mixture unless vented. If such a mixture is present, short circuits, high temperature or static sparks can cause an ignition.

This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

7.2 Conditions for safe storage, including any incompatibilities

Store at room temperature. Elevated temperatures can result in shortened battery life.

Once discharged, store the batteries so that the holes for air are at the top.



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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Housing of the battery is from plastic, but inside it contains a number of chemical products and materials which might be potentially dangerous in the event of accidental release.

MATERIAL OR INGREDIENT	CAS No.	PEL (OSHA)	TLV (ACGIH)	% / wt.
Ammonium chloride [NH ₄ Cl]	12125-02-9	None listed	10 mg/m ³ TWA 20 mg/m ³ STEL	12-14
Zinc chloride [ZnCl ₂]	7646-85-7	1 mg/m ³ TWA (fume)	1 mg/m ³ TWA 2 mg/m ³ STEL	8-10
Calcium chloride dihydrate [CaCl ₂ *2H ₂ O]	10035-04-8	None listed	None listed	1-2
Activated carbon [C]	7440-44-0	5 mg/m ³ (respirable)	10 mg/m ³ (total)	5-7
Manganese dioxide [MnO ₂]	1313-13-9	5 mg/m ³ ceiling (as Mn)	0,2 mg/m ³ TWA (as Mn)	0-3
Zinc [Zn]	7440-66-6	15 mg/m ³ TWA PNOR* (total dust) 5 mg/m ³ TWA PNOR* (respirable fraction)	10 mg/m ³ TWA PNOC* (inhalable particulate) 3 mg/m ³ TWA PNOC* (respirable particulate)	14-23

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Ventilation requirements: Not necessary under normal conditions.

8.2.2 Individual protection measures, such as personal protective equipment

Hand protection		None required under normal use conditions. Use neoprene, rubber or latex gloves when handling open or leaking batteries.
Eye protection		None required under normal use conditions. Wear safety glasses when handling open or leaking batteries.
Respiratory protection		Not necessary under normal conditions.
Rest of the body		Not necessary under normal conditions.
Health and safety measures		Keep batteries out of children's reach.

8.2.3 Environmental exposure controls

No information available at present.



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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state (appearance)	Solid object (cylindrical or rectangular plastic case)
Odour	Odourless
pH-value	Not applicable under normal condition
Boiling point/rate (°C)	Not applicable
Melting point/rate (°C)	MnO ₂ breaks down: ca. 535 °C Zn breaks down: ca. 420 °C NH ₄ Cl breaks down: ca. 335 °C ZnCl ₂ breaks down: ca. 287 °C
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability	It is not flammable
Autoflammability	Not applicable
Explosion risk	It is not explosive (hermetically sealed product, do not expose to heat sources)
Vapour density	Not applicable
Vapour pressure	Not applicable
Relative density	1,7 – 3 g/cm ³
Solubility	Insoluble
Internal components:	
Water solubility	NH ₄ Cl: ca. 374 g/L ZnCl ₂ : ca. 1850 g/L Zink: insoluble
Solubility in other solvents	Not applicable
Distribution coefficient	Not applicable
Auto-ignition temperature	Not applicable
Decomposition temperature	Not applicable
Viscosity	Not applicable
Explosive properties	Not applicable
Oxidising properties	Not applicable

9.2 Other information

Open circuit voltage: 1,5 V per cell.

10. STABILITY AND REACTIVITY

10.1 Reactivity

It is not reactive under normal condition of use.

See also section 7.

10.2 Chemical stability

It is stable under normal condition of use.

See also section 7.

10.3 Possibility of hazardous reactions

See also section 7.

10.4 Condition to avoid

Avoid short-circuit. To achieve this it is not advisable to mix batteries, bring batteries into contact with jewelry, metal tables or any type of electrical conductor. Avoid crushing, perforating or dismantling.

See also section 7.

10.5 Incompatible materials



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See also section 7.

10.6 Hazardous decomposition products

See also subsection 10.4 to 10.6

See also section 5.2

11. TOXICOLOGICAL INFORMATION

Under normal condition of use, zinc-air alkaline batteries are non-toxic. But if battery is opened, its components may cause problems:

MnO₂	Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.	Supply fresh air. Consult doctor if symptoms persist.
	Ingestion: Harmful if swallowed.	Do not induce vomiting: call for medical help immediately.
Zinc	Contact with the skin: May cause irritation of the skin.	Wash thoroughly using copious water – remove contaminated clothing immediately.
	Contact with the eyes: May cause ocular irritation.	Wash thoroughly for several minutes using copious water. Seek medical help if necessary.
	Ingestion: May cause stomach pains, nausea and vomiting.	Gives copious water to drink – consult doctor immediately.
ZnCl₂	Contact with the skin: Corrosive to the skin.	Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician.
	Contact with the eyes: Causes eye damage.	Flush eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician.
	Ingestion: : Harmful if swallowed.	Do not induce vomiting. Give large quantities of water. Call a physician immediately. Never give anything by mouth to an unconscious person.
	Inhalation Fumes, dust from dried-down product, or mist may cause injury to the respiratory tract.	Remove to fresh air immediately. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician
NH₄Cl	Contact with the skin: May cause skin irritation. May be harmful if absorbed through the skin.	Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid at once.
	Contact with the eyes: Causes eye irritation.	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids until no evidence of chemical remains. Get medical aid at once.
	Ingestion: May cause irritation of the digestive tract. May cause systemic toxicity with acidosis.	Do not induce vomiting. If victim is conscious, give 2-4 glasses of water or milk. Get medical aid at once.
	Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.	Give artificial respiration if necessary. Move victim to fresh air. Keep victim warm and at rest. Get medical aid at once.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

None available regarding product.

12.2 Persistence and degradability

Batteries left outdoors may begin to leak through the aeration holes.

12.3 Bioaccumulative potential

Not expected if used/disposed of correctly.

12.4 Mobility in soil

Not expected if used/disposed of correctly.



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12.5 Results of PBT and vPvB assessment

The product is not considered to be a PBT or a vPvB.

12.6 Other adverse effects

Not expected if used/disposed of correctly

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Dispose of in accordance with all applicable federal, state and local regulations. Appropriate disposal technologies include incineration and land filling. Do not incinerate, since batteries may explode at excessive temperatures. In Europe they must be managed according to the Directive 2006/66/CE (and all its updates) of the European Parliament and Council, of 6 September 2006 on batteries and accumulators and waste batteries and accumulators. The residue is catalogued as not dangerous in the European List of Waste (LoW) and has code 16 06 04.

Packaging

Uncontaminated packaging can be recycled.

Dispose of packaging that cannot be cleaned in the same manner as the product.

Pay attention to local and national official regulations.

14. TRANSPORT INFORMATION

All batteries in all forms of transportation (ground, air or ocean) must be packed in a safe responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries must be packed in a manner that prevents short circuits and be contained in strong outer packaging that prevents spillage of contents. All original packaging for Iskra air-saline batteries has been designed to be compliant with these regulatory concerns.

Iskra zinc-air saline batteries are not listed as dangerous goods under the ADR European Agreement Concerning the International Carriage of Dangerous Goods by Road, the IMDG International Maritime Dangerous Goods Code, UN Dangerous Goods Regulations, IATA Dangerous Goods Regulation, ICAO Technical Instructions and the U.S. hazardous materials regulations (49 CFR). These batteries are not subject to the dangerous goods regulations provided they meet the requirements contained in the following special provisions.

Regulatory body

UN
IMDG
ADR
US DOT
ICAO
IATA

Special Provisions

Not regulated.
Not regulated.
Not regulated.
49 CFR 172.102 Provision 130
Not regulated.
A123

All Iskra zinc-air saline batteries are packed in such a way to prevent short circuits or the generation dangerous quantities of heat and meet the special provisions listed above. In addition, the IATA Dangerous Goods Regulations and IACO Technical Instructions require the words "not restricted" and the Special Provision number A123 be provided on the air waybill, when an air waybill is issued.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the product

Not a hazardous substance according to Regulation (EC) No. 1272/2008 (CLP) and its updates (for classification and labelling).

REACH (No. 1907/2006 and its updates): Iskra batteries are manufactured articles and no subject to REACH



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registration requirements. So there is no obligation to generate a safety data sheet. Do not contain any SVCH's on the ECHA Candidate List.

EU RoHS directive: Iskra batteries are not subject to the RoHS Directive.

EU Battery Directive 2006/66/EC and its updates: Each battery is labelled with the crossed-out wheeled bin and capacity, which is indicated on them in a visible, legible and indelible form. Iskra batteries don't need to be marked with the chemical symbols for the metal Hg, Pb or Cd. The residue is catalogued as not dangerous in the European List of Waste (LoW) and has code 16 06 05.

15.2 Chemical safety assessment

No information available at present.

16. OTHER INFORMATION

To the best of our knowledge, the information contained in this Material Safety Data Sheet is accurate and reliable on presently available resources. However, neither the seller nor any of its subsidiaries assumes any responsibility or liability whatsoever for the accuracy or completeness of the information contained herein.

This Material Safety Data Sheet shall not constitute a guarantee for any specific product features. Final determination of suitability of this material is the sole responsibility of the user.

All materials may present unknown hazards and should be used and handled with caution and following reasonable safety procedures. Consequently the buyer assumes all risks in connection with the use and handling of this material.