Material - Safety - Data Sheet (MSDS)

for

Ansmann NiZn Batteries

single cells and multi-cell battery packs

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1. Product and Supplier Identification

Product name:	Ansmann NiZn Battery
Type:	Sealed rechargeable nickel-zinc battery
Models / types:	Round cells
Electrochemical system:	Nickel hydroxide (positive electrode) Zinc oxide (negative electrode) Potassium hydroxide (electrolyte)

Supplier:

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China	HuiZhou City ANSMANN Trading Co. LTD
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EMERGENCY CONTACT: For chemical emergency (spill, leak, fire, exposure or accident) call phone no.: +49 6294 4204 0

2. Hazards Identification

The rechargeable Ni-Zn batteries described in this Product Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer and as long as their integrity is maintained.
Do not short circuit, puncture, incinerate, crush, force discharge or expose to temperatures above the declared operating temperature range of the product. Risk of fire or explosion.
Under normal conditions of use, the active materials and liquid electrolyte contained in the cells and batteries are not exposed to the outside, provided the battery integrity is maintained and seals remain intact. Risk of exposure only in case of abuse (mechanical, thermal, electrical) which leads to the opening of the valves and/or the rupture of the battery container. Electrolyte leakage or battery vent/explosion/fire may follow, depending upon the circumstances.

3. Composition and Informations on Ingredients

Each cell consists of a hermetically sealed metallic container containing a number of chemicals and materials of construction of which the following could potentially be hazardous upon release.

Ingredient	Content	CAS No.	CHIP Classification
Nickel (Ni) (powder)	2 - 3%	7440-02-0	Carc. Cat. 3; T, Xi; R 23-40-43-48 Warning: 3.6/2; 3.4.S/1
Nickel (Di-)Hydroxide $Ni(OH)_2$	45 - 50%	12054-48-7	Carc. Cat. 3; Xn, Xi, N; R 20/22-40-43-50/53 Warning: 3.6/2; 4.1.A/1, 4.1.C/1; 3.1.O/4, 3.1.I/4, 3.4.S/1
Zinc Oxide (ZnO)	30 - 40%	1314-13-2	N; R 50/53 Warning: 4.1.A/1, 4.1.C/1
Zinc (Zn) (powder)	10%	7439-96-5	N; R 50/53 Warning: 4.1.A/1, 4.1.C/1
Cobalt (Co)	< 1%	7740-48-4	
Potassium Hydroxide (KOH)	5 - 10%	1310-58-3	Xn C; R22, R35
Stainless Steel (Fe)	< 15%	7439-89-6	
Bismuth Oxide (Bi_2O_3)	< 1,5%	1304-76-3	
Aluminum Oxide (Al_2O_3)	< 2%	1344-28-1	

4. First Aid Measures

In case of accumulator breakage or burst, please evacuate employees from the contaminated area and ensure maximal ventilation in order to break-up corrosive gas, smoke and unpleasant odours.
If it occurs, by accident, following measures must be taken:

Inhalation: Provide fresh air. In severe cases obtain medical attention.

Skin Contact: Wash off skin thoroughly with water. Remove contaminated clothing and wash before re-use. In severe cases obtain medical attention.

Eye Contact: Irrigate thoroughly with water for at least 15 minutes.Lifting upper and lower lids, until no evidence of the chemical remains. Obtain medical attention.

Ingestion: Wash out mouth thoroughly with water. Do not induce vomiting or give food or drink. Seek medical attention immediately.

Further treatment: All cases of eye contamination, persistent skin irritation and casualities who have swallowed this substance or been affected by breathing its vapours should be seen by a doctor.

5. Fire Fighting Measures

If fire or explosion occurs when batteries are on charge, shut off power to charger.

Extinguishing Media — Suitable extinguishing agents: CO_2 , powder or water spray.
Fight larger fire with water spray or alcohol resistant foam.

Special Hazards arising from the Substance or Mixture — Battery may burst and release hazardous decomposition products when exposed to a fire situation.

Protective Equipment — Fire fighters should wear self-contained breathing apparatus.

Advice for Fire Fighters — Cool fire exposed batteries to prevent rupture

6. Accidental Release Measures

Remove personnel from area until fumes dissipate. Do not breathe vapours or touch liquid with bare hands.
Provide sufficient room ventilation if required.

If the skin has come into contact with the electrolyte, it should be washed thoroughly with water.

Use neoprene or natural rubber gloves and protective glasses, if handling an open or leaking battery.
Battery materials should be collected in a leak-proof container and disposed of as Special Waste
in accordance with local regulations.

7. Precautions for safe Handling and Use

Storage: — Store in a cool (preferable below 25°C), well ventilated area, away from moisture, sources of heat, and open flames.
Elevated temperatures can result in shortened battery life. Temperatures above 70°C may result in battery leakage and rupture.
Keep adequate clearance between walls and batteries.
Since short circuit can cause burn, leakage and rupture hazard,
keep batteries in original packaging until use and do not jumble them.

Handling: — Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) goods, which would end up into excessive heating.
Do not directly heat or solder. Do not throw into fire.
Do not mix batteries of different types and brands. Do not mix new and used batteries. Keep batteries in non conductive (i.e. plastic) trays.
Do not disassemble, mutilate or mechanically abuse cells and batteries.
In order to prevent seal or safety vent damage, never solder the batteries directly at the battery terminals.

Charging: — This battery is made to be charged many times. Use only specified charger.
Follow manufacturer data in respect of charge current and charge time.
Note correct polarity. Improper charging can cause heat damage or even high pressure rupture.

Disposal: — Dispose in accordance with all applicable federal, state and local regulations.

8. Special Protection Information

Ventilation Requirements: — Not necessary under normal conditions. Room ventilation may be required in areas where there are open or leaking batteries.

Respiratory Protection: — Not necessary under normal conditions. Avoid exposure to electrolyte fumes from open or leaking battery. In all fire situations use self-contained breathing apparatus

Eye Protection: — Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.

Hand Protection: — Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery

9. Physical and Chemical Properties

Note: The following points are not applicable unless in case of leaking or damaged batteries with exposed internal components.

Appearance: Nickel plated steel cylindrical cell, evenually sleeved.

Odour: Odourless (unless in case of damaged product with leaking electrolyte)

Flashpoint: Not applicable

Flammability: Not applicable

Relative density: > 2 g/cm3

Specific energy: 30…80Wh/kg

Temperature range: Usage recommended between -40°C and +70°C.

10. Stability and Reactivity

Product is stable under conditions described in Section 7.

Conditions to avoid: Heat above 70° or incinerate. Deform. Mutilate. Crush. Pierce. Disassemble. Short circuit. Expose over a long period to humid conditions.

Materials to avoid: Strong mineral acids, alkali solutions, strong oxidising materials and conductive materials.

Hazardous decomposition products: Electrolyte solution is corrosive to all human tissues and will react violently with many organic chemicals. Electrolyte solution reacts with zinc, aluminum, tin and other materials releasing flammable hydrogen gas.

11. Toxicological Information

Nickel-Zinc batteries are not hazardous waste. Under normal conditions of use, Ni-Zn batteries are non-toxic.
In case of can opening or destruction, the following substances can be released:

Substances			Hazards		
Name	N° CAS N° EC	Symbol	Effects	Exposure limits ACGIH	 OSHA
Nickel	7440-02-0 231-111-4	Ni	LD50/oral/rat: 9000mg/kg	1.5mg/m^3 (inhalable fraction)	1.5mg/m^3 TWA
Nickel-Hydroxyde	12054-48-7 235-008-5	$Ni(OH)_2$	LD50/oral/rat: 1515mg/kg	0.2mg/m^3 PEL	0.2mg/m^3 (insoluble)
Zinc-Oxide	1314-13-2 215-222-5	ZnO	LD50/oral/rat: 7950mg/kg	2mg/m^3 TWA (respirable fraction)	5mg/m^3 TWA
(Di-)Bismuth (trioxide)	1304-76-3	($B_{i2}O_3$)	LD50/oral/rat: 5000mg/kg	not established	not established
Potassium Hydroxide	1310-58-3	KOH	LD50/oral/rat: 273mg/kg	2mg/m^3 Ceiling	none

12. Ecological Information

The sealed Ni-Zn cells as a product are not presenting ecotoxicological hazards. In case of product destruction or opening, the substances described in paragraph 11 can come in contact of the environment. The substances of content in a Ni-Zn battery are toxic for the environment.

If not recycled, it must be disposed of in accordance with all state and local regulations.

Ansmann Ni-Zn cells and batteries belong to the group of **mercury free** batteries.
They do not contain mercury, lead and cadmium as defined by the European directive 2006/66/EC Article 21.

13. Disposal Considerations

USA: Ni-Zn batteries are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries, however, do contain recyclable materials and are accepted for recycling by the Rechargeable Battery Recycling Corporation's (RPBC) Battery Recycling Program. Please go to the RPBC website at www.rbrc.org (www.call2recycle.org) for additional information.

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association ***(http://www.epbaeurope.net/legislation_national.html)***

Importers and users outside EU should consider the local laws and rules.
Dispose of in accordance with appropriate national and local regulations.

In order to avoid short circuit and heating, used nickel zinc cylindrical cells and batteries should never be stored or transported in bulk. Proper measures against short circuit are:
- Storage of batteries in their original packaging
- Coverage of the terminals

14. Transport Information

General considerations
Ansmann nickel zinc cylindrical cells/batteries are considered to be "dry cell" batteries and are unregulated of transportation by the U.S. Department of Transportation (DOT), International Civic Aviation Administration (ICAO), International Air Transport Association (IATA), the "Accord Européen Relatif au Transport International des Merchandises Dangereuses par Route" (ADR) and the "Règlement concernant le transport international ferroviaire de marchandises Dangereuses" (RID).

IATA DGR
Special Provision A123: "Examples of such batteries are: alkali-manganese, zinc-carbon, and nickel-cadmium batteries. Any electrical battery…having the potential of a dangerous evolution of heat must be prepared for transport as to prevent:
(a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals…)
(b) an accidential activation
The words “Not Restricted” and the Special Provision number must be included in the description of the substance on the Air Waybill as required by 8.2.6, when an Air Waybill is issued.

EU (ADR/RID):
As nickel-zinc cells/batteries are not explicitly mentioned in RID/ADR, there are no special Dangerous Goods shipment requirements for these products.

USA: 49 CFR § 172.102 Special Provision 130:
"For other than a dry battery specifically covered by another entry in the § 172.101. table, "Batteries, dry" are not subject to the requirements of this subchapter when they are securely packaged and offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals) and protects against short circuits".

Code of practice for packaging and shipment of primary batteries given in IEC 60086-1: The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture. Shock and vibration shall be kept to a minimum. For instance, boxes should not be thrown off trucks, slammed into position or piled so high as to overload battery containers below. protection from inclement weather should be provided.

Transport in bulk according Annex II of MAPROL 73/78 and the IBC Code:
The batteries must be packaged in a manner that prevents the generation of a dangerous quantity of heat and short circuits.

15. Regulatory Information

Safety, health and environmental regulations / legislation specific for the substance or mixture
SARA

Section 335 (extremely hazardous substances):
None of the ingredients is listed

Section 313 (specific toxic chemical listings):

12054-48-7	nickel dihydroxide
7440-02-0	nickel
1344-28-1	aluminum oxide

TSCA (Toxic Substances Control Act):

12054-48-7	nickel dihydroxide
1314-13-2	zinc oxide
7440-02-0	nickel
1344-28-1	aluminum oxide
1304-76-3	dibismuth trioxide

Proposition 65
Chemical known to cause cancer:

12054-48-7	nickel dihydroxide
7440-02-0	nickel

Chemicals known to cause reproductive toxicity for females:
None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:
None of the ingredients is listed

Chemicals known to cause development toxicity:
None of the ingredients is listed

Cancerogenity categories
EPA (Environmental Protection Agency)

1314-13-2	zinc oxide	II
7440-66-6	zinc powder - zinc dust (stabilized)	II

IARC (International Agency for Research on Cancer)

12054-48-7	nickel dihydroxide	1
7440-02-0	nickel	2B

NTP (National Toxicology Program)

12054-48-7	nickel dihydroxide	K
7440-02-0	nickel	R

TLV (Threshold Limit Value established by ACGIH)

12054-48-7	nickel dihydroxide	A1
7440-02-0	nickel	A5
1344-28-1	aluminum oxide	A4

MAK (German Maximum Workplace Concentration)

12054-48-7	nickel dihydroxide	1
7440-02-0	nickel	1
1344-28-1	aluminum oxide	2

NIOSH-Ca (National Institution for Occupational Safety & Health)

12054-48-7	nickel dihydroxide
7440-02-0	nickel

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients is listed

Labelling according to EU guidelines:
The substance is not subject to classification according to Directive 67/548, 1999/45/EC and 1272/2008/EC.
Observe the general safety regulations when handling chemicals.

Hazard determining components of labelling:
nickel dihydroxide
nickel

Risk Phrases:

20/22	Harmful by inhalation and if swallowed
22/35	
40	Limited evidence of carcinogenic effect
43	May cause sensitization by skin contact
48	Danger of serious damage to health by prolonged exposure
50/53	Very toxic to aquatic organism, may cause long-term adverse effects in the aquatic environment

Safety Phrases:

2	Keep out of the reach of children
29/56	Do not empty into drains, dispose of this material and ist container at hazardous or special waste collection point.
36/37	Wear suitable protective clothing and gloves
46	If swallowed, seek medical advice immediately and show this container or label

National regulations
Candidate list of Substances of Very High Concern (SVHC) according to ECHA (18/06/2010)
None of the ingredients is listed

REACH Regulation Annex XVII Restriction List
None of the ingredients is listed

REACH Regulation Annex XIV Authorization Recommendation List
None of the ingredients is listed

Chemical safety assessment:
not available

Ni-Zn batteries are submitted to the European Community Directive 91-157/CE for recycling.
Substances contained are submitted to the REACH 06-1907/CE regulation

16. Other Information

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.
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