

# Material Safety Data Sheet

## 1. Product & Company Identification

<b>Product name:</b>	Primary zinc/air button cell, non-rechargeable
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Item no.	Size	Nominal Voltage	Capacity	Energy content
2772752	ZA 10	1.4 V	90 mAh	0.126 Wh
2786281	ZA 312	1.4 V	160 mAh	0.224 Wh
2786282	ZA 675	1.4 V	630 mAh	0.882 Wh
2786283	ZA 13	1.4 V	280 mAh	0.392 Wh

<b>Manufacturer:</b>	Conrad Electronic SE
<b>Address:</b>	Klaus-Conrad-Str. 1, D-92240 Hirschau
<b>Telephone:</b>	+49 (0) 9604 / 40 - 8988
<b>Date of issue:</b>	01.01.2023

### Product details

Trade name: Zinc/Air Hearing Aid Batterles

Electrochemical system: Zinc / KOH electrolyte / Oxygen

Anode (negative electrode): Zinc

Cathode (positive electrode): MnOx catalyst

This MSDS applies to the following cell types:

Type	IEC designation	ANSI designation
p675, 675	PR44	ANSI 7003ZD
p13, 13	PR48	ANSI 7000ZD
p312, 312	PR41	ANSI 7002ZD
p10, 10, PR536	PR70	ANSI 7005ZD

### General remark

This information is provided as a service to our customers. The details presented are in accordance with our present knowledge and experiences.

They are no contractual assurances of product attributes.

### Legal remark: (EU)

These batteries are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006 EC. Instead they have to be regarded as "articles", no substances are intended to be released during handling. Therefore there is no obligation to supply a safety data sheet according to Regulation (EC) No 1907/2006, Article 31.

The headings used in this safety data sheet are in line with Annex II of Regulation (EC) No 1907/2006 as amended by Regulation (EU) 2020/878.

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### Legal remark: (USA)

Safety Data Sheets are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an 'article'. According to OSHA, Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Because all of our batteries are defined as 'articles', they are exempted from the requirements of the Hazard Communication Standard.

## 2. Hazards identification

The Zinc/Air Hearing Aid Batteries are not hazardous in normal use (as defined in section 7).

In case of mistreatment (prolonged deep discharge, charge, reverse charge, external short circuit...) and in case of fault, some electrolyte can leak from the cell through the air holes. In these cases refer to the risk of potassium hydroxide solution (corrosive, pH > 14). Charging may cause rupture.

The electrode materials are only hazardous, if the materials are released by mechanical damaging of the cell or if exposed to fire.

## 3. Composition/information on ingredients

### Ingredients

Content	CAS no.	EC no.	Material	Hazard Categories	Hazard Statements
40 -55%	7440-66-6	231-175-3	Zinc	Aquatic Acute 1, Aquatic Chronic 1	H400, H410
25 -45%	confidential	confidential	Nickel plated steel		
3 -10%	1310-58-3	215-181-3	Potassium hydroxide	Acute Tox. 4, Skin Corr. 1A	H302, H314
2-7%	confidential	confidential	Polymers		
1-5 %	7440-50-8	231-159-6	Copper		
0-1%	confidential	confidential	Manganese oxide	Acute Tox. 4, Skin Irrit. 2, Eye Irrit. 2, STOT SE 3	H302, H312, H315, H319, H332, H335
0.01-0.03%	439-92-1	231-100-4	Lead	Repr. 1A, Acute Tox. 4, STOT RE 2, Aquatic Chronic 1	H302, H332, H360D, H373, H410
Remainder	confidential	confidential	Inert Materials		

For full text of hazard statements see section 16.

Substances relevant for Battery Directive 2006/66/EC

Content	CAS no.	EC no.	Material
< 0.0300%	7439-92-1	231-100-4	Lead
< 0.0005%	7440-43-9	231-152-8	Cadmium
< 0.0005%	7439-97-6	231-106-7	Mercury (none intentionally introduced, see section 12)



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### 4. First-aid measures

**After inhalation:**

Fresh air. Seek for medical assistance.

**After skin contact:**

Remove solid particles immediately. Flush affected areas with plenty of water (at least 15 min). Remove contaminated cloth immediately. Seek for medical assistance.

**After eye contact:**

Flush the eye gently with plenty of water (at least 15 min). Seek for medical assistance.

**After ingestion of battery components:**

Avoid vomiting. Seek for medical assistance. No trials for neutralization.

**After ingestion of battery:**

In the event of battery ingestion, seek immediate medical attention at a hospital emergency room. Do not let the person who ingested the battery eat or drink until an X-ray can determine if a battery is present. If you still have the battery packaging or the device containing the battery take this with you to help the physician identify the battery type and chemistry.

**Further advice for health professionals:**

<https://www.poison.org/battery/guideline>

### 5. Fire-fighting measures

**Suitable extinguishing media:**

Use foam, dry powder or carbon dioxide (CO<sub>2</sub>) as appropriate.

**Extinguishing media with limited suitability:**

Water is only applicable for incipient fire.

**Special protection equipment during fire-fighting:**

Firefighting clothing and self-contained breathing apparatus.

**Special hazard:**

(none)

### 6 Accidental release measures

**Person related measures:**

Wear personal protective equipment adapted to the situation (protection gloves, cloth).

**Environment protection measures:**

In the event of cell rupture, prevent skin contact and collect all released material in a plastic lined container. Dispose off according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.

**Treatment for cleaning:**

If cell casing is dismantled, small amounts of electrolyte may leak. Pack the cell or its remains including ingredients as described above. Then clean with water.



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### 7 Handling and storage

#### Guideline for safe handling:

- Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types.
- Keep batteries away from children.
- For devices to be used by children or mentally handicapped persons, the battery casing must be protected against unauthorized access.
- Unpacked batteries shall not lie about in bulk.
- In case of battery change always replace all batteries by new ones of identical type and brand.
- Do not swallow batteries.
- Do not throw batteries into water.
- Do not throw batteries into fire.
- Avoid deep discharge.
- Do not short-circuit batteries.
- Do not recharge primary batteries.
- Do not open or disassemble batteries.

#### Supply to private end users:

In case the products are supplied to private end users packed with equipment or contained in equipment it is strongly recommended to follow these rules: The product should be marked with a graphical symbol that alerts the user to refer to the instruction manual. The instruction manual itself should contain:

- a warning marking with text to alert the user of the hazard associated with coin/button battery ingestion,
- an instruction as to the presence of a coin/button cell battery,
- possible effects of battery ingestion,
- an instruction to keep batteries away from children,
- an advice to seek immediate medical attention if it suspected that batteries have either been swallowed or placed inside any part of the body.

#### Further advice for parents:

<https://button.batterysafety.com>

#### Further advice for health professionals:

<https://www.poison.org/battery/guideline>

#### Environmental conditions:

10 °C to 30 °C and 20 % to 80 % relative humidity for storage

-10 °C to 65 °C and 5 % to 95 % relative humidity for short exposition (e.g. transport)

Avoid large temperature changes. Do not store close to heating devices. Avoid direct sunlight. At higher temperature the electrical performance may be reduced.

Storage of unpacked batteries can cause short circuit and heat generation.



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### Storage category according to TRGS 510:

It is recommended to consider the "Technical Rule for Hazardous Substances TRGS 510 - Storage of hazardous substances in nonstationary containers" and to handle Zinc/Air Hearing Aid Batteries according to storage category 11 ('combustible solids').

### Storage of Large amounts:

If possible, store the batteries in original packaging (short circuit protection). A fire alarm is recommended. For automatic fire extinction consider section 5.

## 8. Exposure controls/personal protection

Under normal conditions (discharge) release of ingredients does not occur. Avoid prolonged deep discharge.

## 9. Physical and chemical properties

Not applicable if closed.

## 10. Stability and reactivity

Dangerous reactions: When heated above 60 °C the risk of rupture occurs.

## 11. Toxicological information

Under normal conditions (discharge) release of ingredients does not occur. Avoid prolonged deep discharge. If accidental release occurs see information in sections 2 to 4 end 6.

Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up. See section 4.

## 12. Ecological information

Zinc/Air Hearing Aid Batteries do contain lead, and do not contain mercury and cadmium as defined by the European directive 2006/66/EC Article 21.

Mercury has not been 'intentionally introduced (as distinguished from mercury that may be incidentally present in other materials)' in the sense of the USA 'Mercury-Containing and Rechargeable Battery Management Act' (May 13 1996).

Zinc/Air Hearing Aid Batteries with mercury content < 5 mg/kg are mercury-free batteries in accordance to China national standard GB24428-2009 'Limitation of Mercury Content for Zinc Silver Oxide, Zinc Air end Zinc Manganese Dioxide Button Batteries'.



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### 13. Disposal considerations

In order to avoid short circuit and heating, used Zinc/Air Hearing Aid Batteries should never be stored or transported in bulk. Proper measures against short circuit are:

- Storage of batteries in original packaging
- Coverage of the terminals
- Embedding in dry sand

#### European Union

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 ([www.epbaeurope.net](http://www.epbaeurope.net)).

Importers and users outside EU should consider the local law and rules.

#### USA

Zinc/Air Hearing Aid 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 Call2Recycle, Inc. Please go to their website at [www.call2recycle.org](http://www.call2recycle.org) for additional information.

### 14. Transport information

#### General considerations

Zinc/Air Hearing Aid Batteries are considered to be 'dry cell' batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA), the International Maritime Organization (IMO), the Accord Européen Relatif au Transport International des Marchandises Dangereuses par Route (ADR) and the Règlement concernant le transport international ferroviaire de marchandises Dangereuses (RID).

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."

#### 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. ...by the effective insulation of exposed terminals.); and (b) accidental 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.'

#### ADR/RID/IMDG Code

As primary alkaline cells are not explicitly mentioned in these Dangerous Goods regulations, there are no special Dangerous Goods shipment requirements for these products.



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### USA

49 CFR §172.102 Special Provision 130: 'Dry batteries not specifically covered by another entry in the §172.101 Table are covered by this entry ( i.e., Batteries, dry, sealed, n.o.s.) and are not subject to requirements of this subchapter except for the following: [ . . . ] (b) Preparation for transport. Batteries and battery-powered device(s) containing batteries must be prepared and packaged for transport in a manner to prevent: (1) A dangerous evolution of heat; (2) Short circuits, including but not limited to the following methods: [..] (ii) Separating or packaging batteries in a manner to prevent contact with other batteries, devices or conductive materials (e.g., metal in the packaging); and (3) Damage to terminals. If not impact resistant, the outer packaging should not be used as the sole means of protecting the battery terminals from damage or short circuiting. Batteries must be securely cushioned and packed to prevent shifting which could loosen terminal caps or reorient the terminals to produce short circuits.'

## 15. Regulatory information

### Marking consideration (EU)

Zinc/Air Hearing Aid Batteries conform to the requirements of the Medical Devices Directive 93/42/EEC class 1 and are thus marked with the CE symbol.

According to 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 all batteries have to be marked with the crossed bin; according to Article 21 of this directive primary zinc/air button cells have to be marked with the element symbol 'Pb'.

### Marking consideration (USA)

The casing of Zinc/Air Hearing Aid Batteries is made out of Nickel plated steel. For the exposition to Nickel no safe-harbour Level is given in California Proposition 65, officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986. Therefore the following warning must be given to customers in the State of California: 'WARNING: This product can expose you to chemicals including nickel, which is known to the State of California to cause cancer. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).' The warning must be given together with a triangular yellow warning symbol.

### International safety standards

According to IEC 60086-5:2021 system P button cells do not require testing.

According to ANSI C18.1M, Part 2-2019 'zinc air button cells or batteries under 700 mAh are exempt from any testing.'

### Water hazard class

The regulations of the German Federal Water Management Act (WHG) are not applicable as Zinc/Air Hearing Aid Batteries are articles and not substances, thus there is no risk of water pollution, except the batteries are violated or dismantled.

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### 16. Other information

Full text of Hazard Statements referred to under section 3:

H225 Highly flammable liquid and vapour.

H228 Flammable solid.

H250 Catches fire spontaneously if exposed to air.

H260 In contact with water releases flammable gases which may ignite spontaneously.

H271 May cause fire or explosion; strong oxidiser.

H272 May intensify fire; oxidiser.

H301 Toxic if swallowed.

H302 Harmful if swallowed.

H312 Harmful in contact with skin.

H314 Causes severe skin burns and eye damage.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

H330 Fatal if inhaled.

H332 Harmful if inhaled.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H335 May cause respiratory irritation.

H341 Suspected of causing genetic defects.

H350 May cause cancer.

H350i May cause cancer by inhalation.

H351 Suspected of causing cancer.

H360 May damage fertility or the unborn child.

H360D May damage the unborn child.

H360FD May damage fertility. May damage the unborn child.

H372 Causes damage to organs through prolonged or repeated exposure.

H373 May cause damage to organs through prolonged or repeated exposure.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long Lasting effects.

H411 Toxic to aquatic Life with long Lasting effects.

H412 Harmful to aquatic life with long Lasting effects.

H413 May cause long Lasting harmful effects to aquatic life.





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Latest covered modifications of transport regulations:

Air: IATA DGR 2023 (64th edition)

Road: ADR 2023

Sea: IMDG Code 2020 (inc. Amdt. 40-20)

Rail: RID 2023

Latest covered modification of the European Battery Directive 2006/66/EC:

Directive (EU) 2018/849