



## Material Safety Data Sheet

### 1. Product & Company Identification

<b>Product:</b>	Alkaline battery (size AAA/micro, LR03)
<b>Manufacturer:</b>	Conrad Electronic SE
<b>Nominal voltage:</b>	1,5 V
<b>Address:</b>	Klaus-Conrad-Str. 1, D-92240 Hirschau
<b>Telephone:</b>	+49 (0) 9604 / 40 - 8988
<b>Date of issue:</b>	10.03.2014

### 2. Hazardous Ingredients / Identity Information

Chemical identity	Approximate value (%Wt)	OSHA PEL	ACGIH TLV	Appearance
Zinc (Zn)	/	NA	NA	Silvery solid
Manganese Dioxide (MnO <sub>2</sub> )	/	Note 2	Note 2	Black-brown powder
Potassium Hydroxide (KOH)	/	NA	NA	White solid
Carbon black	/	Note 3	Note 3	Black granule
Ion water	/	NA	NA	Liquid
Steel	/	NA	NA	Metal solid
Mercury	≤1ppm (note 1)	NA	NA	Atom state
Cadmium	≤250ppm (note 1)	NA	NA	Atom state
Lead	≤4000ppm (note 1)	NA	NA	Atom state

Note 1: the contents of heavy metal (mercury, cadmium and lead) confirms to the requirements of 98/101/EC.

Note 2: Manganese Dioxide (as Mn)---5mg/m<sup>3</sup> (ceiling) (OSHA); 0.2mg/m<sup>3</sup> (as Mn/ ACGIH)

Note 3: Carbon black---15mg/m<sup>3</sup> (total dust, OSHA); 7.5mg/m<sup>3</sup> (respirable fraction, OSHA); 2.0mg/m<sup>3</sup> (ACGIH)

\*\*\*These levels are not anticipated under normal consumer use conditions.

\*\*\*ACGIH: American Council of Governmental Industrial Hygienists

\*\*\*OSHA: Occupational Safety and Health Administration (U.S)

\*\*\*PEL: Permissible Exposure Limit

\*\*\*TLV: Threshold Limit Value



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### 3. Physical and Chemical Characteristics

Chemical identity	Specific gravity (g/cm <sup>3</sup> )	Boiling point (°C)	Melting point (°C)	Odor	Corrosion	Toxicity	Flammability
Zinc (Zn)	7.09	907	419	-	-	-	-
Manganese Dioxide (MnO <sub>2</sub> )	5.026	535	390	-	-	-	-
Potassium Hydroxide (KOH)	2.04	1320	360.44	-	slight	-	-
Carbon black	-	-	-	-	-	-	-
Ion water	1.0	100	-	-	-	-	-
Steel	7.8	2750	1535	-	-	-	-
Mercury	13.6	357	-39.3	-	-	Note 4	-
Cadmium	8.64	765	321.1	-	-	Note 4	-
Lead	11.34	1740	327.5	-	-	Note 4	-

Note 4: The contents of heavy metal (mercury, cadmium, lead) correspond to the requirements of 98/101/EC.

The following components are found in a battery with metal jacket:

Component	Material	Formula	CAS#
Positive electrode	Manganese dioxide	MnO <sub>2</sub>	1313-13-9
	Black carbon	C	7782-42-5
Negative electrode	Zinc	Zn	7440-66-6
Electrolyte	Potassium Hydroxide	KOH	1310-58-3
Metal jacket	Steel	Fe	-

### 4. Reactivity

Stability:	Stable
Polymerization:	Will not occur.
Conditions to avoid:	Do not heat, crush and disassemble, short-circuit or recharge.
Incompatible materials:	n/a
Hazardous decomposition products:	Thermal degradation may produce hazardous fumes of zinc and manganese, such as hydrogen gas.
Warning signals:	n/a



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### 5. Physical data (battery)

Appearance/Color:	cylindrical batteries, contents dark in color
Flash point and test methods:	n/a
Flammable limits in air (% by volume):	n/a
Boiling point:	n/a
Melting point:	n/a
Freezing point:	n/a
Specific gravity (H <sub>2</sub> O = 1):	n/a
Vapor density (air = 1):	n/a
Vapor pressure:	n/a
Evaporation:	n/a
Saturation in air:	n/a
Autoignition temp.:	n/a
% volatiles:	n/a
Solubility in water:	n/a
PH:	n/a

### 6. Routes/Effects of Exposure

These chemicals and metals are contained in a sealed can. 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 temperature or is mechanically, physically or electrically abused.

#### Inhalation:

Respiratory (and eye) irritation may occur if fumes are released due to heat or an abundance of leaking batteries.

#### Ingestion:

Not anticipated due to size of batteries; choking may occur with the small AAA battery. Irritation, including caustic burns/injury, may occur following exposure to a leaking battery.

#### Skin:

Irritation, including caustic burns/injury, may occur following exposure

a) contact to a leaking battery.

b) absorption n/a

#### Eye contact:

Irritation, including caustic burns/injury, may occur following exposure to a leaking battery.

#### Other:

n/a



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### 7. Environmental Impact

**Dot Hazard class:**

n/a

**Environmental effects:**

All alkaline batteries are manufactured with no mercury added. These batteries are classified by the federal government as a non-hazardous waste and are safe for disposal in the normal municipal waste stream.

### 8. Exposure Control Methods

**Engineering controls:**

General ventilation under normal use conditions.

**Eye protection:**

None under normal use conditions. Wear safety glasses when handling leaking batteries.

**Skin protection:**

None under normal use conditions. Use neoprene, rubber or latex-nitrile gloves when handling leaking batteries.

**Respiratory protection:**

None under normal use conditions.

**Other:**

Keep batteries away from small children.

### 9. Work Practices

**Handling and storage:**

Store at room temperature. Avoid mechanical or electrical abuse. Do not short or install incorrectly. Batteries may explode or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. Do not mix battery systems, such as alkaline and zinc carbon, in the same equipment. Replace all batteries equipment at the same time. Do not carry batteries loose in pocket or bag.

**Normal clean up:**

n/a

**Waste disposal methods:**

Individual consumers may dispose of spent (used) batteries with household trash. Do not incinerate, since batteries may explode at excessive temperatures.



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### 10. Emergency Procedures

**Steps to be taken if materials are released to the environment:**

Notify safety personnel of large spills. Slight caustic zinc chloride and Ammonium chloride may be released from leaking or ruptured batteries. Avoid eye or skin contact and inhalation of vapors. Increase ventilation. Clean-up personnel should wear appropriate protective gear.

**Fire and explosion hazard:**

In case of fire, carbon dioxide, carbon monoxide and other toxic organic substances will be generated. Do not inhale fumes and smoke.

**Extinguishing media:**

Carbon dioxide, foam, dry chemical powder

**Extinguishing media not to be used:**

Never use a direct water jet.

**Firefighting procedures:**

Use self-contained breathing apparatus and full protective gear.

### 11. First-aid and Medical Emergency Procedures

**Eyes:**

Not anticipated. If battery is leaking and material contacts eyes,

- 1) flush eyes thoroughly with tepid water for 15 minutes,
- 2) flush eyes with 3 % H<sub>3</sub>BO<sub>3</sub> (Boracic acid),
- 3) contact physician at once.

**Skin:**

Not anticipated. If battery is leaking and material contacts skin, flush with copious amount of clear, tepid water for 15 minutes. If irritation, injury or pain persists, consult a physician.

**Inhalation:**

Not anticipated. Rinse the mouth and surrounding area with clear, tepid water for at least 15 minutes. Consult a physician immediately for treatment and to rule out involvement of the esophagus and other tissues.

### 12. Toxicological Information

The product is a multi component mixture for which no toxicological data exists.

### 13. Ecological Information

In general, no ecological data is available for preparations.

Precautions avoid disposing into drainage systems and in the environment.



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### 14. Disposable Considerations

Do not dispose of into environment or into sewerage.

If recycling is not possible, the product and its container have to be disposed of in accordance with your local legislation and regulations.

### 15. Transport Information

Road: not regulated

Air: not regulated

Sea: not regulated

Remark: Batteries must be protected from short circuit and protected from movement that could lead to short circuit.

IMO: not regulated as hazardous material

### 16. Regulatory Information

Symbol: n/a

Contains: Expiration date is on the card.

### 17. Other Information

Material safety data sheets (MSDS) 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 defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle - which is formed to a specific shape or design during manufacture, -which has end use function dependent in whole or in part upon its shape or design during end use, and -which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

Because all of our batteries are defined as „article“, they are exempt from the requirements of the hazard communication standard, hence a MSDS is not required.

Note:

Since the materials in this battery are sealed in the can, the potential for exposure to the components of battery is negligible, when the battery is used as directed however, technical or electrical abuse of the battery may result in the release of battery contents.



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### 18. Storage and Stock Rotation

1.

For normal storage, the temperature should be between +10 °C and +25 °C and never exceed +30 °C. Extremes of humidity (over 95 % and below 40 % relative humidity) for sustained periods should be avoided since they are detrimental to both batteries and packing. Therefore, batteries should not be stored next to radiators or boilers, in boxcars or direct sunlight, or next to other sources of heat.

2.

Although the storage life of batteries at room temperature is good, storage is improved at lower temperature provided that special precautions are taken. The batteries should be enclosed in special protective packing (such as sealed plastic bags or variants), which should be retained to protect them from condensation during the time they are warming to ambient temperature. Accelerated warming is harmful.

3.

The height to which batteries may be stacked is clearly dependent on the strength of the pack. As a general guide, this height should not exceed 1.5 m for cardboard packs or 3.0 m for wooden cases.

4.

The above recommendations are equally valid for storage conditions during prolonged transit. Thus, batteries should be stored away from ship engines and not left for long periods in unventilated metal box cars (containers) during summer.

5.

Batteries should be dispatched promptly after manufacture and in rotation to distribution centers and on to the user. In order to stock rotation (first-in, first-out) can be practiced, storage areas and displays should be properly and packs should be adequately marked.