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### Lithium primary cylindrical cell

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## 1. Identification of the product and of the company undertaking

### Product details

Trade name:	Lithium primary cylindrical cell
Voltage:	3.0 V (or multiples of this in case of multi-cell configurations)
Electrochemical system:	Lithium metal   organic electrolyte   manganese dioxide
Anode (negative):	Lithium metal
Cathode (positive):	Manganese dioxide

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Type:	Lithium content per cell:
CR 1/2 AA	0,30 g
CR 2/3 AA	0,44 g
CR 2/3 A	0,58 g
CR AA	0,58 g
CR 2 NP	0,48 g

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### Supplier details

Address:	VARTA Microbattery GmbH Daimlerstr. 1 D-73479 Ellwangen/Jagst Germany
Emergency telephone number:	+49 7961 921 110 (VAC)

### Legal Remark (U.S.A.)

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 anything defined by OSHA as an "article". OSHA has defined "article" as 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, 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.

### Legal remark (EU)

These batteries are no "substances" or "preparations" 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 MSDS according to Regulation (EC) 1907/2006, Article 31.

### General remark

This "Safety 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.

### 2. Hazards identification

The battery is sealed hermetically. Thus, the ingredients have no hazard potential, except the battery is violated or dismantled.

If in case of mistreatment the ingredients are released, a spontaneously flammable gas mixture may be released under certain circumstances (measures according to chapter 4 to 6).

Attention: If batteries are treated wrong the danger of burns or bursts occurs. Batteries must not be heated above 100 °C or incinerated. The battery contents must not get in contact with water. If the negative electrode gets in contact with water or humidity hydrogen gas is formed, which may inflame spontaneously.

### 3. Composition/information on ingredients

#### Ingredients

Contents	CAS No.	Classification	R Phrases	Material
1 - 3 %	7439-93-2	F; C	14/15 34	Lithium
13 - 40 %	1313-13-9	Xn	20/22	Manganese dioxide
4 - 16 %		F; Repr. Cat. 2; Xn	60 61 11 19 20 36	Organic electrolyte, consisting of lithium perchlorate, organic carbonates and ethers

Full text of Classification and R-phrases: see section 16.

#### Heavy Metals

Contents	CAS No.	Material
< 1 mg/kg	7440-43-9	Cadmium
< 10 mg/kg	7439-92-1	Lead
< 0,1 mg/kg	7439-97-6	Mercury (none intentionally introduced, see Chapter 12)

#### Other Ingredients

Contents	CAS No.	Material
33 - 74 %		Steel and nickel
3 - 10 %		Plastic

### 4. First-aid measures

#### Measures at accidental release

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:	Drink plenty of water. Avoid vomiting. Seek for medical assistance. No trials for neutralization.

### 5. Fire-fighting measures

Suitable extinguishing media:	Metal fire extinction powder, rock salt or dry sand shall be used.
Extinguishing media with limited suitability:	Carbon dioxide (CO <sub>2</sub> ) is not suitable. Water has to be avoided.
Special protection equipment during fire-fighting:	Contamination cloth including breathing apparatus.
Special hazard:	Cells may explode and release metal parts. At contact of anode material with water extremely flammable hydrogen gas and caustic liquid are released.
Attention:	Do not let used extinguishing media penetrate into surface water or ground water. Dispose off properly.

### 6. Accidental release measures

Person related measures:	Wear personal protective equipment adapted to the situation (protection gloves, cloth, face protection, breathing protection).
Environment protection measures:	Bind released ingredients with powder (rock salt, sand). Dispose off according to the local law and rules. Avoid leached substances to penetrate into the earth, canalization or water.
Treatment for cleaning:	If battery casing is dismantled, small amounts of electrolyte may leak. Package the battery tightly including ingredients together with lime, sand or rock salt. Then clean with water.

### 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, the battery casing should 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. Do not short-circuit batteries. Do not recharge primary batteries.
Storage:	Storage preferably at room temperature (approx. 20°C). Avoid large temperature changes. Avoid direct sunlight. At higher temperature the electrical performance may be reduced. Storage of unpacked batteries can cause short circuit and heat generation.
Storage of large amounts:	If possible, store the batteries in original packaging (because of short circuit protection and exemptions according to transport regulations); A fire alarm is recommended; For automatic fire extinction consider chapter 5 "Fire fighting measures".
Storage category according to TRGS 510:	It is recommended to consider the "VCI Guideline for the mixed storage of chemicals" and to handle lithium polymer batteries according to storage category 11 ("combustible solids").

### 8. Exposure controls/personal protection

Under normal conditions (during discharge) release of ingredients does not occur.

### 9. Physical and chemical properties

Not applicable if closed.

### 10. Stability and reactivity

Dangerous reactions: When heated above 100°C the risk of rupture occurs.

### 11. Toxicological information

Under normal conditions (during charge and discharge) release of ingredients does not occur. In case of accidental release see information in chapter 2.

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

### 12. Ecological information

Lithium primary cylindrical cells do not contain heavy metals as defined by the European directives 2006/66/EC Article 21; they comply with the chemical composition requirements of this Directive.

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

The Regulation on Mercury Content Limitation for Batteries promulgated on 1997-12-31 by the China authorities including the State Administration of Light Industry and the State Environmental Protection Administration defines 'low mercury' as 'mercury content by weight in battery as less than 0.025%', and 'mercury free' as 'mercury content by weight in battery as less than 0.0001%'. And therefore: Varta lithium primary cylindrical cells/batteries belong to the category of mercury-free battery (mercury content lower than 0.0001%).

### 13. Disposal considerations

USA: Lithium primary cylindrical cells are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream.

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](http://www.epbaeurope.net/legislation_national.html)).

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

In order to avoid short circuit and heating, used lithium primary cylindrical cells 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

### 14. Transport information

#### General considerations

Lithium primary cylindrical cells manufactured by VARTA Microbattery are considered to be UN3090 Lithium Metal Batteries and are tested according to 38.3 of the "UN Manual of Tests and Criteria" for compliance with the requirements of special provisions ADR 188, IMDG 188, DOT / 49 CFR § 173.102, and the requirements of IATA DGR packing instruction 968 Section II. Positive test results required for not restricted transportation are stated in dedicated "Declarations of Conformity". In addition, the following conditions for not restricted transportation are fulfilled for these products in original VARTA packaging:

The batteries contain an equivalent amount of not more than 1 g lithium per cell and 2 g lithium per battery.

The batteries are isolated in the packaging to avoid short circuits.

The packs are marked with a warning notice, that clearly states that the pack contains lithium batteries and must be quarantined, inspected and repacked if damaged.

For air transport, the total mass does not exceed 2.5 kg per pack; for other transports 30 kg are allowed.

During the transportation of large amounts of batteries by ship, trailer or railway, do not store them in places of high temperature and do not allow them to be exposed to condensation. During the transportation do not allow the packaging to be damaged, as a damage of the packaging may cause fire. In the event packaging is damaged, special procedures must be used including inspection and repackaging if necessary and handle with care.

#### USA

Primary (non-rechargeable) lithium batteries and cells are forbidden for transport aboard passenger carrying aircraft. The outside of each package that contains primary (non-rechargeable) lithium batteries or cells must be marked "PRIMARY LITHIUM BATTERIES-FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT" on a background of contrasting color.

#### IEC 60086-1

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.*

### 15. Regulatory information

#### Marking consideration:

For the state of California these batteries have to be marked as "containing perchlorate".

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" the batteries have to be marked with the crossed bin.

#### International safety standards:

The basis cells are approved according to UL 1642.

#### Water hazard class:

(according to German Federal Water Management Act) non-water pollution according to VwVwS Appendix 1 (No. 1443 and 766)

### 16. Other information

Full text of Classification and R-phrases referred to under sections 2 and 3

Classification	Xn	Harmful
	F	Highly flammable
	C	Corrosive
	Repr. Cat. 2	Toxic for reproduction category 2

  

R Phrases	11	Highly flammable.
	14/15	Reacts violently with water, liberating extremely flammable gases.
	19	May form explosive peroxides.
	20	Harmful by inhalation.
	20/22	Harmful by inhalation and if swallowed
	34	Causes burns
	36	Irritating to eyes.
	60	May impair fertility.
	61	May cause harm to the unborn child.

**Note:** Date of issue of the transport regulations: ADR 2011, RID 2011, IATA 2012, IMDG 2010, DOT / 49 CFR 2012.  
Latest covered modification of the European Battery Directive 2006/66/EC: Directive 2008/103/EC.

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