

### Lithium primary button cell

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

### Product details

|                         |   |
|-------------------------|---|
| Trade name:             | Lithium primary button cell                             |
| Electrochemical system: | Lithium metal   organic electrolyte   manganese dioxide |
| Anode (negative):       | Lithium metal   |
| Cathode (positive):     | Manganese dioxide                                       |

| Type:     | Voltage | Lithium content per cell: |
|-----------|---------|---------------------------|
| CR 1025   | 3.0 V   | 0.009 g                   |
| CR 1216   | 3.0 V   | 0.008 g                   |
| CR 1220   | 3.0 V   | 0.01 g                    |
| CR 1225   | 3.0 V   | 0.015 g                   |
| CR 1616   | 3.0 V   | 0.02 g                    |
| CR 1620   | 3.0 V   | 0.02 g                    |
| CR 1632   | 3.0 V   | 0.04 g                    |
| CR 2016   | 3.0 V   | 0.03 g                    |
| CR 2016-P | 3.0 V   | 0.03 g                    |
| CR 2025   | 3.0 V   | 0.05 g                    |
| CR 2025-P | 3.0 V   | 0.05 g                    |
| CR 2032   | 3.0 V   | 0.07 g                    |
| CR 2032-P | 3.0 V   | 0.07 g                    |
| CR 2320   | 3.0 V   | 0.043 g                   |
| CR 2354   | 3.0 V   | 0.15 g                    |
| CR 2430   | 3.0 V   | 0.09 g                    |
| CR 2430-P | 3.0 V   | 0.09 g                    |
| CR 2450   | 3.0 V   | 0.17 g                    |
| CR 2450-P | 3.0 V   | 0.17 g                    |
| CR 1/3 N  | 3.0 V   | 0.06 g                    |
| p 28 pxl  | 6.0 V   | 0.12 g                    |

### Supplier details

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

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

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.

### 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) 1907/2006, Article 31".

### General remark

This Safety Data Sheet 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.   | Hazard Categories  | Hazard Statements            | Material             |
|-----------|-----------|--|------------------------------|----------------------|
| 1 - 3 %   | 7439-93-2 | Water-react. 1<br>Skin Corr. 1B                          | H260<br>H314                 | Lithium              |
| 13 - 40 % | 1313-13-9 | Acute Tox. 4   | H302<br>H332                 | Manganese dioxide    |
| < 10 %    | 108-32-7  | Eye Irrit. 2   | H319                         | Propylene carbonate  |
| < 10 %    | 110-71-4  | Flam. Liq. 2<br>Repr. 1B<br>Acute Tox. 4                 | H225<br>H360-FD<br>H332      | 1,2-Dimethoxy ethane |
| < 5 %     | 646-06-0  | Flam. Liq. 2   | H225                         | 1,3-Dioxolane        |
| < 5 %     | 7791-03-9 | Ox. Sol. 2<br>Skin Irrit. 2<br>Eye Irrit. 2<br>STOT SE 3 | H272<br>H315<br>H319<br>H335 | Lithium perchlorate  |

Full text of Hazard statements: see section 16.

### Heavy Metals and RoHS Relevant Substances

| 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<br>(none intentionally introduced,<br>see Chapter 12) |
| < 5 mg/kg   |           | Hexavalent Chromium (Cr <sup>6+</sup> )                       |
| < 5 mg/kg   |           | PBB   |
| < 5 mg/kg   |           | PBDE  |

### Other Ingredients

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

### SVHC substances according to REACH (Article 33)

| Contents | EC No.    | CAS No.  | Material  |
|----------|-----------|----------|---|
| > 0.1 %  | 203-794-9 | 110-71-4 | 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME) |

For information to allow safe use: see section 7.

## 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 of battery components: | Drink plenty of water. Avoid vomiting. Seek for medical assistance.<br>No trials for neutralization.  |

### After ingestion of battery:

In the event of battery ingestion, seek immediate medical attention at a hospital emergency room.

**Warning:** Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion.

Do not let your child 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 doctor identify the battery type and chemistry.

Further advice for the medical sector: <http://buttonbatterysafety.com/>

See also Chapter 7.

### 5. Fire-fighting measures

|  |   |
|--|---|
| Suitable extinguishing media:                      | Metal fire extinction powder, rock salt or dry sand shall be used.<br>In case only water is available, it can be used in large amounts.                 |
| Extinguishing media with limited suitability:      | Carbon dioxide (CO <sub>2</sub> ) is not suitable.<br>Water in small quantities may have adverse effects.   |
| Special protection equipment during fire-fighting: | Protective clothing including breathing apparatus.  |
| Special hazard:                                    | Cells may explode and release metal parts.<br>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).<br>Dispose of according to the local law and rules.<br>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.<br>Keep batteries away from children.<br>For devices to be used by children, the battery casing should be protected against unauthorized access.<br>Unpacked batteries shall not lie about in bulk.<br>In case of battery change always replace all batteries by new ones of identical type and brand.<br>Do not swallow batteries.<br>Do not throw batteries into water.<br>Do not throw batteries into fire.<br>Do not short-circuit batteries.<br>Do not recharge primary batteries.<br>Do not open or disassemble batteries.<br>Further advice for parents:<br><a href="http://buttonbatterysafety.com/">http://buttonbatterysafety.com/</a><br><a href="http://www.productsafety.gov.au/content/index.phtml/itemId/993224">http://www.productsafety.gov.au/content/index.phtml/itemId/993224</a> |
| 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 UL product and instruction manual requirements:<br>The product is required to be marked with a graphical symbol that alerts the user to refer to the instruction manual.<br>The instruction manual itself is required to contain<br>- a warning marking with text to alert the user of the potential chemical burn hazard associated with coin/button battery ingestion,<br>- an instruction as to the presence of a coin/button cell battery,<br>- possible effects of battery ingestion,<br>- an instruction to keep batteries away from children,<br>- an advice to seek immediate medical attention if it suspected that batteries have either been swallowed or placed inside any part of the body.  |

|   |   |
|---|---|
| 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.<br>Storage of unpacked batteries can cause short circuit and heat generation.   |
| 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 lithium primary button cells according to storage category 11 ("combustible solids").  |
| Storage of large amounts:               | Follow the recommendations of the German Insurance Association (GDV - "Gesamtverband der Deutschen Versicherungswirtschaft e.V.") concerning lithium batteries:<br><a href="https://vds.de/fileadmin/vds_publicationen/vds_3103en_web.pdf">https://vds.de/fileadmin/vds_publicationen/vds_3103en_web.pdf</a><br>In case of storage of large amounts (used storage volume > 7 m <sup>3</sup> and/or more than 6 pallets) batteries shall be stored in fire-resistant or separated rooms or areas (e.g. warehouse or container for hazardous materials). Mixed storage with other products is not allowed. The storage area shall be monitored by an automatic fire detection system, connected to a permanently manned place. A fire-extinguishing system shall reflect the extinguishing agents mentioned in chapter 5. |

## 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 button cells manufactured by VARTA Microbattery 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 button cells/batteries belong to the category of mercury-free battery (mercury content lower than 0.0001%).

### 13. Disposal considerations

USA: Lithium primary button 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 button 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 button 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, as well as the requirements of DOT / 49 CFR § 173.185, and the General Requirements of IATA DGR packing instruction 968. Positive test results as well as other relevant information required for transportation are stated in dedicated "Declarations of Conformity".

Transportations of cells or batteries packed with equipment or contained in equipment have to follow the appropriate regulations for UN3091.

Compilations of transport requirements for Lithium batteries can be found in:

<https://www.lithium-batterie-service.de/en/>

<http://www.iata.org/whatwedo/cargo/dgr/Documents/lithium-battery-shipping-guidelines.pdf>

Each cell/battery is manufactured under the quality management program described in IATA DGR clause 3.9.2.6, ADR clause 2.2.9.1.7 e), and IMDG code clause 2.9.4.5.

#### 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. Due to the size of the products the battery need not be marked but a symbol measuring at least 1 x 1 cm shall be printed on the packaging.

#### International safety standards:

The basis cells are recognized components according to UL 1642.

#### Water hazard class:

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

### 16. Other information

#### Full text of Hazard Statements referred to under section 3

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|        |  |
|--------|--|
| H225   | Highly flammable liquid and vapour.  |
| H260   | In contact with water releases flammable gases which may ignite spontaneously. |
| H272   | May intensify fire; oxidizer.  |
| H302   | Harmful if swallowed.  |
| H314   | Causes severe skin burns and eye damage.                                       |
| H315   | Causes skin irritation.  |
| H319   | Causes serious eye irritation.   |
| H332   | Harmful if inhaled.  |
| H335   | May cause respiratory irritation.  |
| H360FD | May damage fertility. May damage the unborn child.                             |

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|                   |   |
|-------------------|---|
| <b>Note:</b>      | Date of issue of the transport regulations: ADR 2019, RID 2019, IATA 2019 (60th edition), IMDG 2016, DOT / 49 CFR 2019.<br>Latest covered modification of the European Battery Directive 2006/66/EC: Directive (EU) 2018/849. |
| <b>Issued by:</b> | VARTA Microbattery GmbH<br>Quality / Environmental Management   |
| <b>RoHS:</b>      | See special <a href="#">Declaration</a>   |
| <b>REACH:</b>     | See special <a href="#">Declaration</a>   |
| <b>Issued by:</b> | VARTA Microbattery GmbH<br>Quality / Environmental Management   |
| <b>Contact:</b>   | <a href="https://www.varta-microbattery.com/contact/?lang=en">https://www.varta-microbattery.com/contact/?lang=en</a>   |
| <b>Updates:</b>   | Current SDS can be downloaded from <a href="#">VARTA's web page</a> (select Document Type "MATERIAL SAFETY DATA SHEET").  |