Safety Data Sheet MSDS 2.001.034

Rechargeable Lithium-Ion Button Cell Series: Li-Ion accu ...

1 Identification of the product and of the company

Product details

Trade name	VARTA Li-Ion accu
Electrochemical system:	Lithium ion
Anode (negative):	Graphite based
Cathode (positive):	Lithium nickel manganese cobalt oxide

This MSDS applies to the following cell types.

The values listed for energy and voltage are given for reference only; they are not contractual assurances of product attributes and may differ from values given in specifications, data sheets or other documents.

Type	Alternative Designation	Energy per cell	Nominal voltage per cell
Li-Ion accu 30	-	0.1 Wh	3.7 V
Li-Ion accu 30L3	30L3	0.1 Wh	3.7 V
Li-Ion accu 45L3	45L3	0.1 Wh	3.7 V
Li-Ion accu 60	-	0.1 Wh	3.7 V
Li-Ion accu 60L1	60L1	0.1 Wh	3.7 V
Li-Ion accu 60L2	60L2	0.1 Wh	3.7 V
Li-Ion accu 60L3	60L3	0.1 Wh	3.7 V
Li-Ion accu 60L4	60L4	0.1 Wh	3.7 V
Li-Ion accu 85	-	0.1 Wh	3.7 V
Li-Ion accu 85L1	85L1	0.1 Wh	3.7 V
Li-Ion accu 85L3	85L3	0.1 Wh	3.7 V
Li-Ion accu 85L4	85L4	0.2 Wh	3.7 V
Li-Ion accu 85L4W	85L4W	0.2 Wh	3.7 V
Li-Ion accu 94	-	0.1 Wh	3.7 V
Li-Ion accu 94L3	94L3	0.2 Wh	3.7 V
Li-Ion accu 100	-	0.1 Wh	3.7 V
Li-Ion accu 120	-	0.1 Wh	3.7 V
Li-Ion accu 160L3	160L3	0.2 Wh	3.7 V
Li-Ion accu 185	-	0.2 Wh	3.7 V
Li-Ion accu 220	-	0.2 Wh	3.7 V

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Li-Ion accu 440	-	0.4 Wh	3.7 V

Supplier details

Address:	VARTA Microbattery GmbH VARTA-Platz 1 73479 Ellwangen Germany
Emergency Phone Number:	+49 7961 921 110 (VAC)

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.

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.

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.

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 sections 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

Content	CAS no.	EC no.	Material	Hazard Categories	Hazard Statements
18 – 70 %	confidential	confidential	Nickel-plated steel		
10 – 40 %	182442-95-1	695-690-9	Lithium nickel manganese cobalt oxide	Skin Sens. 1, Acute Tox. 2, Resp. Sens. 1, Carc. 1B, STOT RE 1, Aquatic Chronic 3	H317, H330, H334, H350, H372, H412
5 – 20 %	7782-42-5	231-955-3	Graphite		
5 – 20 %	confidential	confidential	Organic electrolyte, consisting of $LiPF_6$, organic carbonates and additives	Flam. Liq. 2, Skin Corr. 1B, Eye Dam. 1, Skin Sens. 1, Muta. 2, Carc. 2, Aquatic Chronic 2	H225, H312, H314, H317, H341, H351, H411
2 – 15 %	7440-50-8	231-159-6	Copper		
2 – 10 %	7429-90-5	231-072-3	Aluminium		
2 – 10 %	confidential	confidential	Polymer		

For full text of hazard statements see section 16.

During charge process a lithium carbon intercalation phase is formed, which is highly flammable and corrosive, but not released under the circumstances of normal usage.

Substances relevant for EU Battery Regulation (2023/1542)

Content	CAS no.	EC no.	Material
< 0.0010 %	7439-92-1	231-100-4	Lead
< 0.0001 %	7440-43-9	231-152-8	Cadmium
< 0.0001 %	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:	Drink plenty of water. 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. **Warning:** Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 hours of ingestion. In case of ingestion of a cell or battery, seek medical assistance promptly.
Further advice for health professionals:	https://www.poison.org/battery/guideline

5 Fire-fighting measures

Suitable extinguishing media:	Metal fire extinction powder, rock salt or dry sand shall be used. In case only water is available, it can be used in large amounts.
Extinguishing media with limited suitability:	Carbon dioxide (CO_2) is not suitable. Water in small quantities may have adverse effects.
Special protection equipment during fire-fighting:	Firefighting clothing and self-contained breathing apparatus.
Special hazard:	Cells may explode and release metal parts. At contact of electrolyte with water traces of hydrofluoric acid may be formed. In this case avoid contact and take care for good ventilation. At contact of charged anode material with water extremely flammable hydrogen gas is generated.
Attention:	Do not let used extinguishing media penetrate into surface water or ground water. If necessary, thicken water or foam with suitable solids. Dispose of properly.

6 Accidental release measures

Person related measures:	Wear personal protective equipment adapted to the situation (protection gloves, face protection, breathing protection).
Environment protection measures:	In the event of battery rupture, prevent skin contact and collect all released material in a plastic lined container. Bind released ingredients with powder (rock salt, sand). Dispose of 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.

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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. Keep small cells and batteries which are considered swallowable out of the reach of 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. Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion. In case of ingestion of a cell or battery, seek medical assistance promptly. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries. Use recommended charging time and current. 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 UL product and instruction manual requirements. The product is required to be marked with a graphical symbol that alerts the user to refer to the instruction manual. The instruction manual itself is required to contain • an attention word, such as "Caution", "Warning", or "Danger", • a brief description of possible hazards associated with mishandling of the battery, such as burn hazard, fire hazard, explosion hazard, • a list of actions to take to avoid possible hazards, such as "do not crush, disassemble, dispose of in fire", or similar actions, • instructions regarding replacement batteries if the batteries are replaceable by the user, • a warning marking with text to alert the user of the potential chemical burn 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, and • an advice to seek immediate medical attention if it suspected that batteries have either been swallowed or placed inside any part of the body. A lithium ion battery pack shall be marked with the following or equivalent: "CAUTION: Risk of fire and burns. Do not open, crush, heat above manufacturer's specified maximum temperature or incinerate. Follow manufacturer's instructions".
Further advice for parents:	https://buttonbatterysafety.com
Further advice for health professionals:	https://www.poison.org/battery/guideline
Environmental conditions:	For normal storage, the temperature should be between +10 °C and +25 °C and never exceed +35 °C. For short exposition (e.g. during transport) temperature may be in the range of –20 °C to +60 °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 packaging. Batteries should therefore not be stored next to heating devices, nor in direct sunlight. Avoid large temperature changes. At higher temperature the electrical performance may be reduced. Refer to the cell data sheet for more details.
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 ion batteries 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: VdS 3103. In case of storage of large amounts (used storage volume > 7 m^3 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 section 5.

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8 Exposure controls/personal protection

Keep away from heat and open flame. Store in a cool, dry place. Under normal conditions (during charge and discharge) release of ingredients does not occur.

9 Physical and chemical properties

Not applicable if closed.

10 Stability and reactivity

Please refer to the technical data sheet and the handling precautions.

11 Toxicological information

Under normal conditions (during charge and discharge) release of ingredients does not occur. In case of accidental release see information in sections 2 to 4 and 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

VARTA Li-Ion accu series lithium ion batteries do not contain heavy metals as defined by the EU Battery Regulation (2023/1542) Article 6; they comply with the chemical composition requirements of this Regulation.

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 Li-Ion accu series lithium ion batteries belong to the category of mercury-free battery (mercury content lower than 0.0001 %).

13 Disposal considerations

In order to avoid short circuit and heating, used VARTA Li-Ion accu series lithium ion 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 Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 on batteries and accumulators and waste batteries and accumulators. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association (www.epbaeurope.net).

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

USA

VARTA Li-Ion accu series lithium ion 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 for additional information.

14 Transport information

VARTA Li-Ion accu series lithium ion batteries are considered to be UN 3480 Lithium Ion Batteries, hazard class 9, and are tested according to subsection 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 requirements of IATA DGR packing instruction 965. Test results as well as other relevant information required for transportation are given in dedicated "Supplier's Test Summaries".

Please note that for some products state of charge and VARTA packaging are not designed for air transport in bulk; this does not affect air transport of batteries packed with equipment or contained in equipment.

Transportations of cells or batteries packed with equipment or contained in equipment have to follow the appropriate regulations for UN 3481.

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.

Code of practice for packaging and shipment of secondary batteries given in IEC 62133: 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.

Compilations of transport requirements for Lithium batteries can be found in:
https://www.lithium-batterie-service.de/en/
https://www.iata.org/en/programs/cargo/dgr/lithium-batteries/

Each cell or battery is manufactured under a quality management program according to IATA DGR clause 3.9.2.6, ADR clause 2.2.9.1.7 e), and IMDG code clause 2.9.4.5.

15 Regulatory information

Marking consideration

European Union:

VARTA Lithium Ion Button Cells conform to the requirements of the EU Battery Regulation (EU) 2023/1542 and are thus marked with the CE symbol from August 18, 2024. Due to the size of the battery it is not possible to print the CE marking (miniumum size of 5 mm) on the battery itself, therefore it is affixed to the packaging and to the documents accompanying the battery.

According to the EU Battery Regulation, 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 × 1 cm shall be printed on the packaging.

According to Dangerous Goods Regulations (see section 14) battery packs have to be marked with the Watt-hour rating.

International safety standards

For UL recognition of the basis cells according to UL 1642 see: BBCV2.MH13654

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Water hazard class

The regulations of the German Federal Water Management Act (WHG) are not applicable as VARTA Li-Ion accu series lithium ion batteries are articles and not substances, thus there is no risk of water pollution, except the batteries are violated or dismantled. In case of fire-fighting measures, please be aware that the substances listed in Table 3 can be relevant for water hazard classes.

16 Other information

Full text of Hazard Statements referred to under section 3:

Code	Phrase
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.
H311	Toxic in contact with skin.
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.

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Code	**Phrase** (continued)
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.

Covered regulations:

Latest covered modifications of transport regulations:

- Air: IATA DGR 2026 (67th edition)
- Road: ADR 2026
- Sea: IMDG Code 2024 (inc. Amdt. 42-24)
- Rail: RID 2026

Latest covered modification of the European Battery Regulation (2023/1542):

Issued by:

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Product Compliance

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Updates:

Current SDS can be downloaded from VARTA's web page
https://www.varta-ag.com/en/industry/product-solutions