Safety Data Sheet
MSDS 2.001.002

Rechargeable Ni-MH Button

1. Identification of the product and of the company undertaking

Product details

Trade name:	Rechargeable Ni-MH button
Product types	V15H, V30H, V40H, V65HT, V80H, V110HT, V150H, V150HT, V180H, V200H, V250H, CP300H, V350H, V500HT (or multi-cell assemblies of these basis cells, number x of cells indicated by x/...); V6HR, RTC6, V18HRT, MBU20, V20HR, V60HR, V120HR, V150PT, V160HRT, V450HR, V500HRT, V500HTE, V600HR, V600HRT, V650HRT (or multi-cell assemblies of these basis cells, number x of cells indicated by x/...); V7/8H, p6/8h, p7/8h; p10 accu, p312 accu, p13 accu, p675 accu
Voltage:	1.2 V (or multiples of 1.2 V in case of assembled batteries)
Electrochemical system:	Nickel metal hydride
Anode (negative electrode):	Metal hydride
Cathode (positive electrode):	Nickel hydroxide

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.)

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

A sealed Nickel-Metal hydride cell/battery is not hazardous in normal use; especially the release of hydrogen gas is excluded.

In case of mistreatment (abusive over charge, reverse charge, external short circuit…) and in case of fault some electrolyte can leak from the cell through the safety device. In these cases refer to the risk of potassium hydroxide solution (corrosive, pH > 14). 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

Contents	CAS No.	Hazard Categories	Hazard Statements	Material
10 - 35 %		Flam. Sol. 2	H228	Mischmetal nickel alloy
		Pyr. Sol. 1	H250	
		Resp. Sens. 1	H334	
		Skin Sens. 1	H317	
		Carc. 2	H351	
		STOT RE 1	H372	
		Aquatic Chronic 3	H412	
10 - 40 %	12054-48-7	Carc. 1A	H350i	Nickel hydroxide
		Repr. 1B	H360D	
		Muta. 2	H341	
		STOT RE 1	H372	
		Acute Tox. 4 *	H332	
			H302	
		Skin Irrit. 2	H315	
		Resp. Sens. 1	H334	
		Skin Sens. 1	H317	
		Aquatic Acute 1	H400	
		Aquatic Chronic 1	H410	
3 - 15 %	1310-58-3	Acute Tox. 4	H302	Potassium hydroxide
		Skin Corr. 1A	H314	
0 - 0.3 %	1310-73-2	Skin Corr. 1A	H314	Sodium hydroxide
0 - 0.1 %	1310-65-2	Acute Tox. 3	H301	Lithium hydroxide
		Skin Corr. 1A	H314	
0 - 3 %		Acute Tox. 4	H302	Cobalt and compounds
		Skin Sens. 1	H317	
		Aquatic Acute 1	H400	
		Aquatic Chronic 1	H410	

Full text of Hazard statements: see section 16.

Heavy Metals and RoHS Relevant Substances

Contents	CAS No.	Material
< 5 mg/kg	7440-43-9	Cadmium (none intentionally introduced)
< 15 mg/kg	7439-92-1	Lead (none intentionally introduced)
< 1 mg/kg	7439-97-6	Mercury (none intentionally introduced, see Chapter 12)
< 5 mg/kg		Hexavalent Chromium (Cr^{6+})
< 5 mg/kg		PBB
< 5 mg/kg		PBDE

Electronically generated document - no signature required.

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Other Ingredients

Contents	CAS No.	Material
15 - 60 %		Steel and nickel
3 - 10 %		Polymers (including external coating and isolation material)

During charge process, the mischmetal nickel alloy is loaded with hydrogen, this compound is flammable.

4. First-aid measures

Measures at accidental release

After inhalation:	Fresh air. Seek for medical assistance.
After skin contact:	Flush affected areas with plenty of water. Remove contaminated cloth immediately. Seek for medical assistance.
After eye contact:	Flush the eye gently with plenty of water (at least 15 minutes). Seek for medical assistance.
After ingestion:	Drink plenty of water. Avoid vomiting. Seek for medical assistance. No trials for neutralization.
	Further advice for the medical sector: http://buttonbatterysafety.com/
	See also Chapter 7.

5. Fire-fighting measures

Suitable extinguishing media:	Use foam, dry powder or dry sand, as appropriate.
Extinguishing media with limited suitability:	Carbon dioxide (CO_2) and water volume are only applicable for incipient fire.
Special protection equipment during fire-fighting:	Contamination cloth including breathing apparatus.
Special hazard:	Under fire conditions, the electrode materials can form carcinogenic nickel and cobalt oxides.

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 battery 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 battery casing is dismantled, small amounts of electrolyte may leak. Pack the battery including ingredients as described above. 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. Avoid deep discharge. Do not short-circuit batteries Use recommended charging time and current. Do not open or disassemble batteries. Further advice for parents: http://buttonbatterysafety.com/
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 - 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, - 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 20°C. Avoid large temperature changes. Do not store close to the heating. Avoid direct sunlight.
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 chapter 5 “Fire-fighting measures”.
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 nickel metal hydride button cells according to storage category 11 (“combustible solids“).

8. Exposure controls/personal protection

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

Dangerous reactions:	When heated above 150°C the risk of rupture occurs. Due to special safety construction, rupture implies controlled release of pressure without ignition.

11. Toxicological information

Under normal conditions (during charge and discharge) release of ingredients does not occur. If accidental release occurs see information in section 2, 3, and 4.

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12. Ecological information

VARTA nickel metal hydride button cells/batteries do not contain heavy metals as defined by the European directive 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 Nickel metal hydride button cells/batteries belong to the category of mercury-free battery (mercury content lower than 0.0001%).

13. Disposal considerations

USA: Nickel metal hydride button cells/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.

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).

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

In order to avoid short circuit and heating, used nickel metal hydride button cells/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

14. Transport information

VARTA nickel metal hydride button cells/batteries are considered to be “dry cell” batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civic 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).

IATA DGR: Special Provision A199: *The UN number UN 3496 is only applicable in sea transport. Nickel-metal hydride batteries or nickel-metal hydride battery-powered devices, equipment or vehicles having the potential of a dangerous evolution of heat are not subject to these Regulations provided they are prepared for transport so as to prevent: a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and (b) unintentional 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.*

IMO, IMDG Code: Special Provision 963: *“Nickel-metal hydride button cells or nickel-metal hydride cells or batteries packed with or contained in equipment are not subject to the provisions of this Code.”*

EU (ADR/RID): Chapter 3.2 Table A: “*Batteries, nickel-metal hydride, UN 3496, not subject to ADR”*

USA: 49 CFR § 172.102 Special Provisions 130 and 340: Nickel metal hydride button cells/batteries *are not subject to requirements of this subchapter except for the following ...“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: (i) Packaging each battery or each battery-powered device when practicable, in fully enclosed inner packagings made of non-conductive material; (ii) Separating or packaging batteries in a manner to prevent contact with other batteries, devices or conductive materials (e.g., metal) in the packagings”...*

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.*

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15. Regulatory information

Marking consideration:	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 on the packaging..
International safety standards:	The following cells/batteries are recognized components according to UL 2054: 3/V450HR, 3/V400HR, 6/V20HR, CP300H, MBU20, V18HRT, RTC6, V6HR, V15H, V20HR, V30H, V40H, V60HR, V65HT, V80H, V110HT, V150H, V150HT, V180H, V200H, V250H, V300H, V350H, V400HR, V450HR, V500HRT, V500HT, V500HTE, V600HR, V600HRT, V650HRT, V150PT, V6/8H, V7/8H, P6/8H-ULTRA, P7/8H-ULTRA, P7/8H , e7/8h ecopack, p312 accu, p13 accu, p10 accu.
Water hazard class:	The regulations of the German Federal Water Management Act (WHG) are not applicable as nickel metal hydride button cells/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

H228	Flammable solid.
H250	Catches fire spontaneously if exposed to air.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341	Suspected of causing genetic defects.
H350i	May cause cancer by inhalation.
H351	Suspected of causing cancer.
H360D	May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Note:	Date of issue of the transport regulations: ADR 2015, RID 2015, IATA 2017 (58th edition), IMDG 2014, DOT / 49 CFR 2016. Latest covered modification of the European Battery Directive 2006/66/EC: Directive 2013/56/EU.
Issued by:	VARTA Microbattery GmbH Quality/Environmental Management
RoHS:	See special Declaration
REACH:	See special Declaration
Contact:	http://contact.varta-microbattery.com
Updates:	Current SDS can be downloaded from VARTA's web page following the link: http://www.varta-microbattery.com/en/news-downloads/downloads.html

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