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### Rechargeable Ni-MH Button

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

### Product details

Trade name:	Rechargeable Ni-MH button
Product types	V15H, 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, V450HR, V500HRT, V600HR, 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.)

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

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.	Classification	R Phrases	Material
10 - 35 %		Carc. Cat. 3; Xn; F	40 - 42/43 11 - 17	Mischmetal nickel alloy
10 - 40 %	12054-48-7	Carc. Cat. 1; Repr. Cat 2; Muta. Cat 3. T; Xn;	49 61 68 48/23 20/22	Nickel hydroxide
3 - 15 %	1310-58-3	Xi; C	38 - 42/43 50/53	Potassium hydroxide
0 - 3 %		Xn; N	22 35 22 - 42/43 50/53	Cobalt and compounds

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

#### Heavy Metals

Contents	CAS No.	Material
< 5 mg/kg	7440-43-9	Cadmium
< 15 mg/kg	7439-92-1	Lead
< 1 mg/kg	7439-97-6	Mercury (none intentionally introduced, see Chapter 12)

#### Other Ingredients

Contents	CAS No.	Material
15 - 60 %		Steel and nickel
3 - 10 %		Polymers

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

### 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.

### 5. Fire fighting measures

Suitable extinguishing media:	Use foam, dry powder or dry sand, as appropriate.
Extinguishing media with limited suitability:	Carbon dioxide (CO <sub>2</sub> ) 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.
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".

VCI storage category: It is recommended to consider the "VCI Guideline for the mixed storage of chemicals" and to handle nickel metal hydride button cells/batteries 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.

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

### 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 the Rechargeable Battery Recycling Corporation's (RPBC) Battery Recycling Program. Please go to the RPRC website at [www.rbr.org](http://www.rbr.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](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 Civil 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 A123: "Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries. Any electrical battery ... having the potential of a dangerous evolution of heat must be prepared for transport as to prevent (a) a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals...) is forbidden from transport; and (b) accidental 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"...

### 15. Regulatory information

**Marking consideration:**

Nickel metal hydride button cells/batteries, which contain electronic modules and which are subjected to the EMC directive 93/97/EEC, must be CE approved and must wear the CE marking.

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.

**International safety standards:**

The basis cells (except p674accu) are approved according to UL 2054.

**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

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<b>Classification</b>	Carc. Cat. 1	Carcinogenic category 1
	Repr. Cat. 2	Toxic for reproduction category 2
	Muta. Cat. 3	Mutagenic category 3
	T	Toxic
	Xn	Harmful
	Xi	Irritant
	F	Highly flammable
	C	Corrosive
	N	Dangerous for the environment

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<b>R Phrases</b>	11	Highly flammable.
	17	Spontaneously flammable in air.
	20/22	Harmful by inhalation and if swallowed.
	22	Harmful if swallowed.
	35	Causes severe burns.
	38	Irritating to skin.
	40	Limited evidence of a carcinogenic effect.
	42/43	May cause sensitization by inhalation and skin contact.
	43	May cause sensitization by skin contact.
	48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
	49	May cause cancer by inhalation.
	50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	61	May cause harm to the unborn child.
68	Possible risks of irreversible effects.	

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**Note:** Date of issue of the transport regulations: ADR 2011, RID 2011, IATA 2011, IMDG 2011, DOT / 49 CFR 2011.

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