SAFETY DATA SHEET
SECONDARY NICKEL-METAL HYDRIDE SEALED CELLS

Revision D on February 29th, 2012: ONU group change for NiMH → code 3496

The information contained within is provided as a service to our customers and for their information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate at the date compiled. Saft makes no warranty expressed or implied.

1. PRODUCT IDENTIFICATION

1.1 Product

Sealed secondary (or rechargeable) Cells
Trade name and model: SAFT, V… according to the model size and design.
IEC designation: KR… according to the international standard IEC 61951-2

Electrochemical system: Nickel/Metal hydride, alkaline electrolyte

Positive electrode:	Nickel hydroxide
Negative electrode:	Metal Hydride
Electrolyte:	Potassium, Sodium and Lithium hydroxide in water solution.

Nominal voltage: 1.2Volts

1.2 Usage

These sealed secondary (or rechargeable) Cells are being used in batteries for energy supply of electrical systems, in applications such as backup units or portable systems.

1.3 Supplier

Head quarters :

Name: SAFT

Address: 12 rue Sadi Carnot – 93170 BAGNOLET

Tel/Fax: +33 (0)1 49 93 19 18 / +33 (0)1 49 93 19 50

Plant:

Name: SAFT- Nersac

Address: Zone Industrielle – 16440 NERSAC - FRANCE

Tel/Fax: +33 (0)5 45 90 50 26 / +33 (0)5 45 90 57 06

1.4 Contact in case of emergency

Emergency contact: Tel +33 (0)1 49 93 19 18

Internet: www.saftbatteries.com section "contact"

2. HAZARDS IDENTIFICATION

A- Human hazards
A sealed Nickel-Metal Hydride cell is not hazardous in normal use.

2.1 Physical

Nickel plated steel cans do not present any risk if cells are used for its intended purpose and according to valid directions for use.

Do not throw in fire or misuse, as a gas containing hydrogen and oxygen can be generated through the safety valve (explosion risk).

3.2 Chemical

Nickel plated steel cans do not present chemical risk in normal use.

In case of misuse (abusive over charge, reverse charge, external short circuit…) and in case of default, some electrolyte can leak from the cell through the safety vent.
In these cases refer to the risk of the alkaline hydroxides.

The toxic properties of the electrode materials are hazardous only if the materials are released by mechanical damaging the cell or if exposed to fire.

B- Environmental hazards

Metals used in a Ni-MH cell have to be collected and recycled through specialised organisations (list on www.rechargebatteries.org).

3. COMPOSITION

Weight percentage of basic materials:

Single cell with steel container

Metals		%	Plastics		%	Other		%
Iron	Fe	15 – 30	Polyamide	PA /PP	2.5 - 3.5	Alcalis	K/Na/Li	1.8 – 3.2
Nickel	Ni	30 – 45	EPDM		< 0.05	Water	H2O	4 - 9
Rare Earth, Mn, Al		7 - 15	Polyethylene	PE	0.2 - 0.4	Hydroxyle	OH-	8 – 14
Cobalt	Co	1 - 5	PVC		0.2 - 0.7			

Classification of dangerous substances contained into the cells.

SUBSTANCES			CLASSIFICATION			
Name	N° EC **N° CAS** *N° EINEC*	Symbol	Letter	Identification of danger	Special risk (1)	Safety advice (2)
Nickel	028-002-00-7 **7440-02-0** *231-111-4*	Ni	Xn	Nocif	R 40-43 R 17	S2, 22, 36
Nickel Hydroxyde	028-008-x* **12054-48-7** *235-008-5*	Ni(OH)2	Xn; N	Carc. cat 3 Harmful	R 20/22, 43, 40 R 50/53	S2 S 22 ,36, 60, 61
Cobalt Hydroxyde	- **21041-93-0** *244-166-4*	Co(OH)2	Xn; N	Harmful	R22-43-50/53	S2-24-37; 60,61
Potassium Hydroxyde	019-002-00-8 **1310-58-3** *215-181-3*	KOH	C, Xi	Corrosive , Irritant	R 35, 22 R36-37	S 26-37/39 -45
Sodium Hydroxyde	011-002-00-6 **1310-73-2** *215-185-5*	NaOH	C	Corrosive	R35	S 26-37/39 -45
Lithium Hydroxyde	**-** **1310-65-2** *215-183-4*	LiOH	C	Corrosive	R 35	S 26-37/39 -45

(1) Nature of special risk

R 17: Spontaneously flammable in air
R 20/21/22: Harmful by inhalation, skin contact or if swallowed.
R 20/22: Harmful by inhalation or ingestion.
R 22: Harmful by ingestion.
R 35: Causes serious burns.
R 36/37: Sensitising for eyes and respiratory system.
R 40: Carcinogenic effect suspected. Possible risk of irreversible effects.
R 43: May cause sensitising by skin contact.
R42/43: May cause sensitising by inhalation and skin contact.
R50/53: Very toxic for aquatics organisms, possible harmful long term effect on aqueous environment.

(2) Safety advice

S 2: Keep out of reach of children.
S 7/8: Keep the container close
S 22: Do not breathe dust.
S 24: Avoid contact with skin
S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36: Wear suitable protection clothing.
S 37: Wear suitable gloves.
S 37/39: Wear suitable gloves and eyes/face protection.
S 45: In case of accident or if you feel unwell, seek medical advice immediately.
S 60: Eliminate as a dangerous product.
S 61: Avoid disposal in the environment. Consult the information about recycling.

4. FIRST AID MEASURES

In case of electrolyte solution spill (cell leakage) precautions must be taken to avoid any contact of human tissues. If it accidentally happens following must be done:

4.1: Inhalation
Fresh air. Rinse mouth and nose with water. Medical treatment.

4.2: Skin contact
Rinse immediately with plenty of water. Medical treatment.

4.3: Eyes contact
Rinse immediately with plenty of water during at least 15-30 min .Immediate hospital treatment. Consult eye specialist.

4.4: Ingestion
If the injured is fully conscious: plenty of drink, preferably milk. Do not induce vomiting. Immediate Hospital treatment.

5. FIRE FIGHTING MEASURES

5.1: Extinguishing media
Suitable: Class D-Dry chemical, sand, CO_2.
Not to be used: Water.

5.2: Special exposure hazards
Cells can be overheated by an external source or by internal shorting and release alkaline electrolyte mist or liquid. Electrolyte reacts with zinc, aluminium, tin and other active materials releasing flammable hydrogen gas.
In case of PVC sleeved products, the combustion releases chloride gas.

5.3: Special protective equipment
Use self-contained breathing apparatus and full fire-fighting protective clothing.

6. SPILL MANAGEMENT PROCEDURE

The sealed Ni-MH cells when sleeved are safe in case of spilling.
Non-sleeved cells may generate short-circuits, causing release of alkaline electrolyte mist or liquid. Electrolyte reacts with zinc, aluminium, tin and other active materials releasing flammable hydrogen gas.

6.1: Individual protections and equipments
In such a case, use self-contained breathing apparatus and protective clothing.

6.2: Environmental precautions
No urgency measure requested.

6.3: cleaning
Collect the cells for recycling, if necessary use sawdust to absorb electrolyte leakages.

7. HANDLING USAGE AND STORAGE PRECAUTIONS

In normal use conditions, no safety rule is specified to handle the cells. Please apply SAFT usage instructions.
It is recommended to store following SAFT specifications in order to ensure longer usage: +5 to +25°C in a 65 +- 5% relative humidity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Under normal condition of use and handling no special protection is required for sealed Ni-MH cells.
Protection equipments: it is recommended to wear gloves, or to remove rings and metallic objects to avoid short-circuiting the cells.

9. PHYSICAL PROPERTIES

9.1: Appearance

Nickel plated steel cylindrical cell, eventually sleeved. Dimensions and colour according specification.

9.2: Temperature range

Usage recommended between -40°C and +70°C.
Risk of electrolyte leakage over 100°C

9.3: Specific energy

33 to 80 Wh/Kg

9.4: Specific instant power

Up to 1000 W/Kg during 1 second

9.5: Mechanical resistance

According mechanical tests in IEC 61951-2 standard.

9 STABILITY AND REACTIVITY

10.1: Conditions

Ni-MH cells are stable in storage.
In case of storage in humid atmosphere, some rust may appear on the product.
In case of storage in a charged state, cells progressively loose their energy, generating eventually a progressive temperature increase according the thermal insulation efficiency of the packaging.
In case of exposure to temperature over 100°C, a risk of release of alkaline electrolyte mist or liquid is created. A higher temperature (160°C) the plastics used can melt or decompose (Polyamide gasket, rubber valve, PVC sleeve…).
In case of mechanical deterioration of the cells, active materials contained as powder ca be dispersed (Nickel, Cobalt, Zinc, Metal hydride).

10.2: Hazardous decomposition products

Electrolyte solution is corrosive to all human tissues and will react violently with many organic chemicals.
Electrolyte solution reacts with zinc, aluminium, tin and other materials releasing flammable hydrogen gas.

10 TOXICOLOGICAL INFORMATION

The sealed Ni-MH cells as a product are not presenting toxicological hazards.
In case of can opening or destruction, the following substances can be released:

SUBSTANCES			HAZARDS		
Name	N° EC **N° CAS** *N° EINEC*	Symbol	effects	Dust exposure limits	Carcinogenicity/ mutagenicity/ reprotoxicity
Nickel	028-002-00-7 **7440-02-0** *231-111-4*	Ni	Xn	Nocif	R 40-43 R 17
Nickel Hydroxyde	028-008-x* **12054-48-7** *235-008-5*	Ni(OH)2	LD50/oral/rat: 1600 mg/Kg	VME : 1000 µg/m3 VLE : /	Occupational
Cobalt Hydroxyde	- **21041-93-0** *244-166-4*	Co(OH)2	LD50/oral/rat: 795 mg/Kg	VME : 100 µg/m3 VLE : /	/
alkaline Hydroxydes	019-002-00-8 1310-58-3	KOH NaOH LiOH	LD50/oral/rat: 365mg/Kg	KOH VME: 2mg/m3 NaOH VME:2mg/m3 LiOH VME : 25µg/m3	/

11 ECOLOGICAL INFORMATION

The sealed Ni-MH cells as a product are not presenting Eco toxicological hazards. In case of product destruction or opening, the substances described in paragraph 11 can come in contact of the environment. The metals content in a Ni-MH battery, and specifically the cadmium, are toxics for the environment.

If not recycled, it must be disposed of in accordance with all state and local regulations.

12 DISPOSAL CONSIDERATIONS

12.1: Incineration

Never incinerate Ni-MH batteries.

12.2: Landfill

Never dispose Ni-MH batteries as landfill.

12.3: Recycling

Nickel Metal hydride batteries can be fully recyclable. They are submitted to the European community directive 91-157/CE. Saft recommends proper recycling of these batteries whenever possible.
You may refer to the following web page for further information and guidance: www.oecd.org/document/44/0,3343,en_2649_34371_1944748_1_1_1_1,00.html (1).You can also contact Saft.

(1) This page provides links to different National Battery Associations and National Collection & Recycling Organizations that can provide you with the latest update on collection & recycling in their respective Countries.

14. TRANSPORT INFORMATION

Sealed Ni-MH batteries with sleeve are considered as “dry batteries” which transport is not checked. They are not submitted to specific transport obligations for land, maritime (IMDG) or air (IATA) transport, as they are protected against short-circuits.
Sealed Ni-MH cells or batteries without sleeve are submitted to ADR prescription under UNO code 3496, except in case of qualified packaging use (IATA group 2 type).

UNO code 3496:
NiMH cells or batteries packed with or contained in equipment are not subject to the provisions of this code.
All other NiMH cells or batteries shall be securely packed and protected from short circuit. They are not subject to other provisions of this code if they are loaded in a cargo transport unit in a total quantity of less than 100 kg gross mass. When the loaded gross mass is equal or higher than 100 kg they are subject to other provisions of this code described in the 3.2 chapter: they have to be kept away from heating sources (Category A).

15. REGULATORY INFORMATIONS

Nickel Metal hydride batteries are submitted to the European community directive 91-157/CE for recycling.
Substances contained are submitted to the REACH 06-1907/CE regulation.

16. OTHER INFORMATIONS

Consult SAFT specifications and precautions of use for optimized use.