



Battery Information Sheet

Industrial Nickel-Metal Hydride cells, modules and battery systems

According to REACH regulation (EC 1907/2006, Art 31) and to OSHA regulation (29 CFR 1910.1200), batteries are **ARTICLES** with no intended release. As such, they are not covered by legal requirements to generate and supply an SDS or an MSDS.

This Battery Information Sheet is provided solely as an information document for the purpose of assisting our customers.

1. IDENTIFICATION

1.1 Product

Industrial Ni-MH cells and modules or battery systems composed of these cells

1.2 Supplier

Headquarters Address Phone/Fax	Saft S.A.S. 12 rue Sadi Carnot, 93170 BAGNOLET – France Phone/Fax: +33 (0)1 49 93 19 18 /+33 (0)1 49 93 19 50
Factory Address Phone/Fax	Saft Bordeaux 111-113, boulevard Alfred Daney, 33074 BORDEAUX - France +33 (0)5 57 10 64 00 /+33 (0)5 57 10 68 77

1.3 Emergency contact Chemtrec US Service within the USA: + 1 800 424 93 00/outside: +1 703 527 3887

2. HAZARD IDENTIFICATION

2.1 At cell level

Not chemically dangerous with normal use, where the electrode materials and the caustic electrolyte are enclosed within the cell in an hermetically-sealed case. In particular, the battery should not be opened or burned. Exposure to /Ingestion of the ingredients contained within could be harmful.

EYE CONTACT: contents of an broken battery (opened cell (electrolyte)) within a battery can cause severe irritation and chemical burns.

SKIN CONTACT: Contents of a broken battery can cause skin irritation and/or chemical burns. Nickel and nickel compounds, cobalt and cobalt compounds can cause skin sensitization and an allergic contact dermatitis.

INHALATION: contents of an open battery can cause respiratory irritation. Surexposure to nickel and cobalt can cause allergic pulmonary asthma.



2.2 At module and battery system level

HIGH VOLTAGE: Always use the large battery systems in a restricted access area. Only authorized people aware of high voltage hazards and trained to work on such systems are allowed to enter in the battery area.

TEMPERATURE: Do not place the batteries on or near fires or other high-temperature locations (> 70°C).

3. COMPOSITION, INFORMATION OR INGREDIENTS

3.1 At cells and modules level

Component	CAS Number	EINECS/ELINCS	Content (wt. %)*
Active nickel**	12054-48-7	235-008-5	30-40
Rare earths***	N/A	N/A	7-10
Cobalt	21041-93-0	244-166-4	2-4
Alkaline electrolyte (pH=14)	N/A	N/A	20-25
Plastics	N/A	N/A	9-15
Steel	N/A	N/A	3-14
Aluminium	7429-90-5	231-072-3	2-4
Copper	7440-50-8	231-159-6	2-6

* Quantities may vary with cell model

** Active nickel present as $Ni(OH)_2$ and $NiOOH$

***Rare earths: Lanthanum La, Cerium Ce, Neodyme Nd, Praseodyme Pr

3.2 At battery system level

Modules are assembled in a steel container.

4. HANDLING AND STORAGE

STORAGE: Store in a cool, dry and well ventilated place (continuous storage, between +5 to +25°C, with occasional storage between -40 to +65°C). Elevated temperatures can result in shortened battery life. Since short circuit can cause burn hazard, keep batteries in original packaging until use and do not jumble them.

HANDLING:

- Do not short (+) or (-) terminal with conductors/conductive materials.
- Do not reverse the polarity
- Do not open battery cells, the negative electrode material may be pyrophoric.
- Do not open the battery system or modules
- Do not submit to excessive mechanical stress.
- Do not apply pressure or deform the battery: Disassembly of the battery may result in irritation of throat caused by gas generation, or in fire caused by heat generation depending on the type of internal short-circuit to the battery. Application of pressure or any kind of mechanical force may cause deformation of the battery. The safety vent or sealing section may be deformed causing electrolyte leakage or short circuit within the battery accompanied by heat generation possibly leading to occurrence of explosion or fire.

CHARGING/DISCHARGING: Refer to Saft Instructions.

5. PHYSICAL AND CHEMICAL PROPERTIES

The Nickel-Metal Hydride cell or battery described by this Battery Information Sheet is a manufactured "article" and does not expose the user to hazardous chemicals when used in accordance with manufacturer specifications.



Boiling Point – Not applicable
Vapor Pressure – Not applicable
Specific Gravity – Not applicable

Melting Point – Not applicable
Vapor Density – Not applicable
Physical shape and colour as supplied

6. STABILITY AND REACTIVITY – the battery system is stable when handled and stored according to section 4

MATERIALS TO AVOID: Oxidizing agents, acids, bases, reducing agents

CONDITIONS TO AVOID: Avoid exposing battery to fire or temperature over 70°C. Do not heat directly, weld or throw into fire. Such unsuitable use can cause leakage and many spout vaporized electrolyte fumes and may cause fire by explosion. Do not disassemble, crush or short-circuit the electrode connections with metal goods or install with incorrect polarity. Avoid deformation/crushing of cells

HAZARDOUS DECOMPOSITION MATERIAL: Nickel compounds, caustic liquid.

7. TOXICOLOGICAL INFORMATION

If the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure toxic and hazardous internal components may be exposed.

- ACUTE TOXICITY

The electrolyte:

Potassium hydroxide	LD50/oral/rat: 365 mg/kg
Lithium hydroxide	No data available

- HEALTH HAZARD

Skin contact can cause severe injury.

Eye contact rapidly causes severe damage. Risk of permanent damage.

Ingestion usually results in severe injury. Risk of permanent injuries.

8. ECOLOGICAL INFORMATION

There is no ecological harm when batteries are used correctly and recycled after use has ended.

Spilled/Released electrolyte: The sharp pH rise may cause harmful impact on fish, plankton and stationary organisms. If released to water bodies, the electrolyte contained in the product can be toxic for aquatic organisms because of alkalinity.

9. DISPOSAL CONSIDERATIONS

As with all battery systems, Ni-MH batteries must be collected separately from other waste and recycled – contact your local Saft representative for information

Never incinerate Ni-MH batteries

Never dispose of Ni-MH batteries in landfills

Europe: End-of-life management must be performed according to directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators as well as its transposition into each European Union's Member State national legislation. Check with Saft or with your national or local environment authority for details.

See the section on "Sustainability & Environment" on <http://www.saftbatteries.com>



10. TRANSPORT INFORMATION

10.1 UNITED NATIONS

- UN N°: 2795
- UN N°: 2800 (alternative number when fully sealed: NHE modules)
- Classification 8

10.2 INTERNATIONAL CONVENTIONS

- Air : IATA
- Sea : IMDG
- Land Europe: ADR (road) or RID (rail)

10.3 APPLICABLE REQUIREMENTS

International air transport is not restricted provided that, as stated in IATA special provision A123, batteries and battery powered devices/equipments being transported by air are protected from short-circuiting and in addition of dangerous or unintended activation in the case of a device/equipment.

Road transport in Europe of new or used cells and batteries with classification UN2795 or UN2800 (Class 8) is not restricted according to ADR special provision 598, providing that requirements of this special provision are met.

Defective or damaged cells or batteries that have the potential of leading to a hazardous event during transportation must not be shipped.

More information concerning shipping, testing, marking, packaging, special provisions and handling of defective/damaged products can be obtained from your Saft sales representative.

11. REGULATORY INFORMATION

11.1 PRODUCT MARKING (EU)



11.2 PRODUCT MARKING (US)

BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY.

12. FIRST AID MEASURES (not anticipated under normal use)

For contact with electrolyte:

EYE CONTACT: Rinse immediately with plenty of water during at least 15-30 minutes, **seek** immediate medical attention/treatment



SKIN CONTACT: Rinse immediately with plenty of water and seek medical attention/treatment

INHALATION: Remove to fresh air, rinse mouth and nose with water and seek immediate medical attention/treatment.

INGESTION: If the injured is fully conscious, clear mouth with water and afterwards drink plenty of water. Do not induce vomiting. Send immediately to hospital for medical attention/treatment.

13. FIRE FIGHTING MEASURES (not anticipated under normal use)

EXTINGUISHING MEDIA:

Use Class D-Dry chemical and/or sand
Do not use water

SPECIAL FIRE FIGHTING PROCEDURES:

Fire fighters should wear self-contained breathing apparatus and full fire-fighting protective clothing.





Cells can overheat by an external source or by an internal shorting and develop potassium hydroxide mist and/or hydrogen gas. In case of fire, toxic fumes including oxides of nickel, cobalt, aluminium, lanthanum, manganese, cerium, neodymium and praseodymium can be produced.

SPECIAL PROTECTIVE EQUIPMENT:

Use self-contained breathing apparatus to avoid breathing toxic fumes. Wear full fighting protective clothing and chemical resistant gloves to prevent potential body contact with electrolyte solution and when cleaning up leaking batteries.

14. EXPOSURE CONTROLS AND PERSONAL PROTECTION* (not necessary under normal use)

Handle an opened battery only in a well ventilated place.

	Respiratory protection	Fire fighters should wear self-contained breathing apparatus.
	Hand protection	Use polypropylene, polyethylene, rubber or Viton gloves when handling leaking or ruptured cells.
	Eye protection	In case of incident or after an abusive use, in case of a leak or cell opening, wear safety glasses with protected side shields or a mask covering the whole face when handling leaking or ruptured cells
	Other	In the event of leakage or ruptured cells, wear a rubber apron and protective clothes.

*AFNOR pictograms

15. ACCIDENTAL RELEASE MEASURES (not anticipated under normal use)

INDIVIDUAL PRECAUTIONS:

In case of fire, evacuate the employees from the area until fumes dispersal.

In case of electrolyte leakage, flush electrolyte spillage with plenty of water and beware risk of slipping/ falling.

In case of skin or eye contact, inhalation or ingestion, follow the measures described in section 12.

ENVIRONMENTAL PRECAUTION: Avoid sewage, surface water and underground water contamination. Avoid ground and atmosphere contamination.



WAYS OF CLEANING: Using protective glasses and gloves, use absorbent material (sand, earth or vermiculite) to absorb any exuded material. Seal leaking battery (unless hot) and contaminated absorbent material in plastic bag or suitable leak proof container and send for recycling in accordance with local regulations.

16. OTHER INFORMATION

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, neither exhaustively nor perfect reliability can be granted. Information does not imply implicit or specific warranty of it.

This information relates to the specific products designated and may not be valid for such products used in combination with any other materials or in any process. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his particular use.

Saft does not accept liability for any loss or damage that may occur, whether direct, indirect, incidental or consequential, from the use of this battery information sheet provided as a service to our customers. Saft does not offer warranty against patent infringement.

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