Nordic Ecolabelling for

Rechargeable batteries and portable chargers

Version 5.0 • date – date
Draft for consultation 22 January 2018

Nordic Ecolabelling

Contents

030 Rechargeable batteries and portable chargers , version 5.0, Date

Addresses

In 1989, the Nordic Council of Ministers decided to introduce a voluntary official ecolabel, the Nordic Swan Ecolabel. These organisations/companies operate the Nordic Ecolabelling system on behalf of their own country's government. For more information, see the websites:

Denmark
Ecolabelling Denmark
Fonden Dansk Standard
Göteborg Plads 1
DK-2150 Nordhavn
Tel: +45 72 300 450
info@ecolabel.dk
www.ecolabel.dk

Iceland
Ecolabelling Iceland
Norræn Umhverfismerking
á Íslandi
Suðurlandsbraut 24
IS-108 Reykjavik
Tel: +354 591 20 00
ust@ust.is
www.svanurinn.is

Finland
Ecolabelling Finland
Box 489
FI-00101 Helsingfors
Tel: +358 9 61 22 50 00
joutsen@ecolabel.fi

Norway
Ecolabelling Norway
Henrik Ibsens gate 20
NO-0255 Oslo
Tel: +47 24 14 46 00
info@svanemerket.no

Sweden
Ecolabelling Sweden
Box 38114
SE-100 64 Stockholm
Tel: +46 8 55 55 24 00
info@svanen.se

www.ecolabel.fi www.svanemerket.no www.svanen.se

What are Nordic Swan Ecolabelled rechargeable batteries and portable chargers?

Nordic Swan Ecolabelled rechargeable batteries and portable chargers live up to recognised quality and safety standards, placing them among the best in the market. Strict requirements apply to the information provided to the consumer. Both of these aspects are intended to ensure that the battery or portable charger will need to be replaced less frequently, thereby “saving” the environment the burden of more batteries than necessary. Portable chargers are designed in such a way that dismantling is possible. The content of lead, cadmium and mercury is lower than the levels stipulated by the authorities in their requirements. The plastic and metals used in the casings of both battery chargers and portable chargers must fulfil strict requirements regarding chlorinated plastic, flame-retardants and types of metals.

Producers and brand owners of batteries and portable chargers must demonstrate good corporate social responsibility regarding the sourcing of conflict minerals, as well as critical raw materials and working conditions.

Nordic Swan Ecolabelled rechargeable batteries and portable chargers:

- Meet stringent requirements for both battery capacity and durability – to ensure a long lifetime for the battery and portable charger.
- Live up to recognised quality and safety standards – to ensure good and safe consumer properties.
- Have a low content of mercury, cadmium and lead – to reduce the spreading and use of metals.
- Meet a CSR policy – to ensure responsible use and sourcing of limited raw materials and “conflict-free minerals.

Why choose the Nordic Swan Ecolabel?

- Licence holders may use the Nordic Swan Ecolabel trademark for marketing. The Nordic Swan Ecolabel is a very well-known and well-reputed trademark in the Nordic region.
- The Nordic Swan Ecolabel is a simple way of communicating environmental work and commitment to customers.
- The Nordic Swan Ecolabel clarifies the most important environmental impacts and thus shows how a company can cut emissions, resource consumption and waste management.
- Environmentally suitable operations prepare rechargeable batteries and portable chargers for future environmental legislation.
- Nordic Ecolabelling can be seen as providing a business with guidance on the work of environmental improvements.
- The Nordic Swan Ecolabel not only covers environmental issues, but also quality requirements, since the environment and quality often go hand in hand. This means that a Nordic Swan Ecolabel licence can also be seen as a mark of quality.

What can carry the Nordic Swan Ecolabel?

The product group comprises the following products:

Portable rechargeable batteries

Portable batteries that are rechargeable in accordance with the definition provided in the European Union’s Battery Directive, 2006/66/EC.

Rechargeable batteries sold together with, or as accessories/parts for, electrical appliances, e.g. cordless power tools, can also be Nordic Swan Ecolabelled. However, the battery must be designed to be replaced and charged in a separate charger. It must be made clear to the purchaser that the Nordic Swan Ecolabel only applies to the battery and not to the electrical appliances, or to other elements of the package.

External battery chargers sold in combination packs with Nordic Swan Ecolabelled batteries are also eligible for a Nordic Swan Ecolabel (including when batteries are sold together with e.g. a power tool, where the charger is purchased together with the tool and the battery). It must be made clear to the purchaser of combination packs of this type that the Nordic Swan Ecolabel applies solely to the batteries and not to the charger, or to other elements of the package.

The following batteries and electrical appliances cannot be Nordic Swan Ecolabelled according to these criteria:

- Car batteries and industrial batteries.
- Primary (non-rechargeable) batteries, for which separate criteria exist.
- Batteries that are built into or form a permanent part of electronic products and where replacement of the batteries is not possible. Portable chargers (portable power banks) are exempt from this requirement, see below.
- Batteries that are built into or form a permanent part of electronic products and where the entire product is placed in a charger.
- Chargers sold for rechargeable batteries alone.

Portable chargers

A portable charger or “portable power bank” is defined as any portable energy-storage device containing secondary batteries with charging circuitry, and which is used to charge portable consumer electronic devices via DC output. Portable chargers with built-in solar panels can also be Nordic Swan Ecolabelled.

The following products do not fall within the above definition of portable chargers: products with AC input, products with jump starter functions, higher-capacity power packs intended for charging high-power industrial devices, and Uninterruptible Power Supply (UPS) systems.

How to apply

Application and costs

For information about the application process and fees for this product group, please refer to the respective **national** web site. For addresses see first in this document.

What is required?

The application must consist of an application form/web form and documentation showing that the requirements are fulfilled.

All product types and brands shall be listed in the application.

Each requirement is marked with the letter O (obligatory requirement) and a number. All requirements must be fulfilled to be awarded a licence.

The text describes how the applicant shall demonstrate fulfilment of each requirement. There are also icons in the text to make this clearer. These icons are:

✉ Enclose

⚲ Requirement checked on site

All information submitted to Nordic Swan Ecolabelling is treated confidentially. Suppliers can send documentation directly to Nordic Ecolabelling, and this will also be treated confidentially.

License validity

The Nordic Swan Ecolabel licence is valid providing the criteria are fulfilled and until the criteria expire. The validity period of the criteria may be extended or adjusted, in which case the licence is automatically extended and the licensee informed.

Revised criteria shall be published at least one year prior to the expiry of the present criteria. The licensee is then offered the opportunity to renew their licence.

On-site inspection

In connection with handling of the application, Nordic Swan Ecolabelling normally performs an on-site inspection to ensure adherence to the requirements. For such an inspection, data used for calculations, original copies of submitted certificates, test records, purchase statistics, and similar documents that support the application must be available for examination.

Queries

Please contact Nordic Ecolabelling if you have any queries or require further information. See first in this document for addresses. Further information and assistance (such as calculation sheets or electronic application help) may be available. Visit the relevant national website for further information.

1 Production and product description

O1 Description of the product

The applicant must submit the following information about the product(s):

- Brand and trading name(s).
- Name and contact details of production location(s) for the manufacture and brand owners(s) of batteries and/or portable chargers.
- Description of the product(s) (detailing all constituent substances present in the battery; metals, other solid substances and liquid chemical substances) in the application (weight %).
- Description of raw materials used in the casing of the battery charger or the portable charger.
- Description of materials used in the primary packaging. Primary packaging: refers to the purchase packaging for the consumer, e.g. the packaging that holds 4 batteries or one portable charger, and which the consumer encounters in sales.
- Description of the manufacturing process for the product.

✉ Description of the above points. Appendix 1 may be used. A flow chart is recommended to explain the production process.

2 Resources

O2 Metal content of batteries

The metal content of the battery may not exceed the following limits:

Metal	Content
Mercury	< 0.1 ppm
Cadmium	< 5.0 ppm
Lead	< 5.0 ppm

It should be noted that the EU's Battery Directive 2006/66/EC permits a maximum cadmium content of 20 ppm and a maximum mercury content of 5 ppm. The test laboratory may need special equipment in order to test batteries for a mercury content of < 0.1 ppm.

At least four examples of the product in question must be analysed and all four must meet the requirement.

The metal content of the batteries must be analysed in accordance with "Battery Industry Standard Analytical Method. For the determination of Mercury, Cadmium and Lead in Alkaline Manganese Cells Using AAS, ICP-AES and "Cold Vapour". European Portable Battery Association (EPBA), Battery Association of Japan (BAJ), and National Electrical Manufacturers Association (NEMA; USA). April 1998".

Similar test methods may be approved if assessed and adjudged to be equivalent to the recommended method by an independent third party.

✉ Report from the analysis body showing the metal content of the batteries.
✉ Declaration confirming that the institution performing the analysis is impartial and fulfils the general requirements applicable to test laboratories, as described in the requirements applicable to the analysis laboratory/test institutions in appendix 5.

O3 Requirements applicable to plastic and metal in the casing of the battery charger and in the outer casing/container that encircles the batteries/cells in the portable charger

The requirement solely applies to plastic and metal in the casing of the battery charger and the outer casing that encircles the batteries/cells in the portable charger. The requirement does not apply to the battery, the casing encircling the battery/cell itself, circuit/PCBs, wires or USB/charge ports.

The plastic or metal in the casing of the battery charger and the outer casing that encircles the batteries/cells in the portable charger must fulfil the following requirements:

Plastic:

- Plastic parts covering a surface > 200 mm^2 in the casing must be labelled in accordance with ISO 11469.
- The plastic may not be chlorinated plastic.
- Cadmium and lead must not be actively added to the plastic in the casing.
- Chloro-paraffins must not be actively added to the plastic in the casing.
- The following flame retardants must not be added to the plastic in the casing:
  a) Hexabromocyclodecane (HBCDD), tetrabromobisphenol A (TBBP-A) and tris(2-chloroethyl)phosphate (TCEP).
  b) Other halogenated organic flame retardants and flame retardants that have been given one or several of the following risk phrases may not be added:
    - H350
    - H350i
    - H340
    - H360D
    - H360F
    - H360Df
    - H360Fd

Metal:

The following metals may not be actively added to the casing in the battery charger and the outer casing that encircles the batteries/cells in the portable charger:

Lead (Pb), mercury (Hg), chromium VI (CrVI), cadmium (Cd), cobalt (Co), antimony (Sb), zinc (Zn,), copper (Cu) or nickel (Ni).

✉ Documentation showing that the casing is labelled in accordance with ISO 11469.

✉ Declaration from the manufacturer of the battery charger or portable charger that the requirement is fulfilled. Appendix 2 may be used.

O4 Battery charger, battery sizes

This requirement applies solely to chargers for rechargeable batteries of the following sizes: AAA: HR03, AA: HR6, C: HR14, D: HR20, 9V: HR 22.

If the rechargeable batteries are sold together with a charger, the charger must be suitable for use with a minimum of two battery sizes.

✉ Declaration from the licensee that the charger can be used for charging a minimum of two battery sizes. Appendix 2 may be used.

✉ A description/documentation of the charger confirming this must be attached.

3 Corporate Social Responsibility

O5 Sourcing of “conflict-free” minerals

The licensee and brand owner(s) must have a public conflict minerals policy and support the responsible sourcing of tin, tantalum, tungsten, gold, cobalt and their ores from conflict-affected and high-risk areas by:

a) Conducting due diligence in line with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas; and

b) Promoting responsible mineral production and trade within conflict-affected and high-risk areas for the identified minerals, as used in components of the products and in accordance with OECD guidance.

✉ The licensee and brand owner(s) shall provide a copy of their conflict mineral policy.

✉ The licensee and brand owner(s) shall describe their due diligence activities along the supply chain for the five minerals identified.

O6 Sourcing of critical raw materials

The licensee and brand owner(s) must have a policy for the use of raw materials included in the EU’s list of critical raw materials[1] in batteries, battery chargers and portable chargers. The list of critical raw materials can be found in appendix 3.

a) The policy must describe how the licensee and brand owner(s) work actively to phase out/recycle any critical raw materials in batteries, battery chargers and portable chargers.

✉ The licensee and brand owner(s) must submit a written policy that describes how the licensee and brand owner(s) work actively to phase out/recycle any critical raw materials in batteries, battery chargers and portable chargers.

O7 Working conditions

The licensee must have a written Code of Conduct that explains how the licensee ensures compliance with the following UN conventions and the UN Global Compact at component, battery, battery charger and portable charger suppliers:

- The UN Convention on the Rights of the Child, Article 32.
- The UN Declaration (61/295) on the Rights of Indigenous Peoples.

The UN's: Global Compact[2], which comprises the following ten principles:

1. Businesses should support and respect the protection of internationally proclaimed human rights.
2. Make sure that they are not complicit in human rights abuses.
3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining (ILO Conventions 87 and 98).
4. The elimination of all forms of forced and compulsory labour; (ILO Conventions 29 and 105).
5. The effective abolition of child labour (ILO Conventions 138 and 182).

[1] http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en
[2] http://www.unglobalcompact.org

6. The elimination of discrimination in respect of employment and occupation (ILO Conventions 100 and 111).
7. Businesses should support a precautionary approach to environmental challenges.
8. Undertake initiatives to promote greater environmental responsibility.
9. Encourage the development and diffusion of environmentally friendly technologies.
10. Businesses should work against corruption in all its forms, including extortion and bribery.

The licensee must ensure that all suppliers are familiar with and comply with the Code of Conduct.

If components, batteries, battery chargers and portable chargers are produced in countries in which these conventions are incorporated as part of the requirements of the authorities, no further documentation will be required beyond the signed application form for a licence for Nordic Ecolabelling.

☒ Licensees must submit a written Code of Conduct that explains how the licensee ensures that its suppliers comply with the requirements of the UN conventions and the UN Global Compact.

☒ A description of how the licensee's Code of Conduct is communicated to all of its suppliers.

4 Packaging and information

Primary packaging: refers to the purchase packaging for the consumer, e.g. the packaging that holds four batteries or one portable charger, and which the consumer encounters in sales.

Secondary packaging: refers to the transport packaging and protects the packs of batteries and portable chargers during transport to stores and consumers.

O8 Packaging

Chlorine-based plastic may not be used in primary and secondary product packaging.

The total proportion of post-consumer recycled material in the primary packaging for the batteries must be at least 80% by weight.

Post-consumer material is defined in accordance with ISO 14021: "Post-consumer/commercial" is defined as material created by households or commercial, industrial or institutional facilities in the role of end users of a product which can no longer be used for the intended purpose. This includes return of material from the distribution chain.

☒ Description of the primary and secondary product packaging. Declaration from the licensee or brand owner (s) showing that the requirement is fulfilled. Appendix 4 may be used.

☒ Documentation from packaging suppliers showing the proportion of post-consumer recycled material in their products.

☒ Statement from the licensee showing that the total proportion of post-consumer recycled material in the primary packaging exceeds 80% weight. Appendix 4 may be used.

5 Electrical testing

O9 Electrical testing

Nickel-metal hydride (NiMH) batteries and cells:

Battery capacity

The battery capacity must be measured in accordance with paragraph 7.3.1 “Discharge performance at 20°C (rated capacity)” of EN 61951-2. The rated capacity (C) thereby determined must be at least as high as the nominal capacity (N) indicated on the battery and in the product documents.

Durability of the battery

The battery must achieve a minimum of 400 full charge cycles:

Full charge cycles ≥ 400

A full charge cycle is to be understood as the drain of a quantity of electricity (in ampere hours) from the battery to the amount of its nominal capacity (N) that has been stored in the battery by one or more charging processes.

The minimum number of full charge cycles achievable shall be specified in the product documents.

After 400 full charge cycles the battery must, in addition, have in a fully charged state, a remaining capacity (Q_{Rem}) of at least 80% of the nominal capacity (N):

$Q_{Rem} \geq 80\% * N$

Leakage

During testing, no leakage may occur.

The requirements concerning test laboratories and test instructions for full charge cycles are stated in Appendix 5.

Li-ion/LiP batteries and cells:

Battery capacity

The battery capacity must be measured in accordance with paragraph 7.3.1 “Discharge performance at 20°C (rated capacity)” of EN 61960-3. The rated capacity (C) thus determined must be at least as high as the nominal capacity (N) indicated on the battery and in the product documents.

Durability of the battery

The battery must achieve a minimum of 500 full charge cycles:

Full charge cycles ≥ 500

A full charge cycle is to be understood as the drain of a quantity of electricity (in ampere hours) from the battery to the amount of its nominal capacity (N) that has been stored in the battery by one or more charging processes.

The minimum number of full charge cycles achievable shall be specified in the product documents.

After 500 full charge cycles the battery must, in addition, have in a fully charged state, a remaining capacity (Q_{Rem}) of at least 90% of the nominal capacity (N):

$Q_{Rem} \geq 90\% * N$

Leakage

During testing, no leakage may occur.

The requirements concerning test laboratories and test instructions for full charge cycles are stated in Appendix 5.

☒ Complete test report, including information that no leakage has occurred during testing.
☒ Documentation showing that the test laboratory fulfil the requirement stated in Appendix 5.

O10 Charged battery

The battery must be fully charged when it leaves the production site.

☒ A declaration confirming that the battery is fully charged when leaving the production site for delivery to customers/brand owners. Appendix 1 may be used.

6 Safety

O11 Battery safety

The requirement applies to both batteries and batteries used in portable chargers.

NiMH batteries/cells:

The battery must fulfil the testing requirements in EN 62133-1.

Lithium-ion/lithium polymer batteries/cells:

The batteries must fulfil the testing requirements in EN 62133-2.

The requirements concerning test laboratories are stated in Appendix 5.

☒ Complete test report.
☒ Documentation showing that the test laboratory fulfil the requirement stated in Appendix 5.

O12 Portable charger safety

Portable chargers (power banks) must be tested and comply with IEC 60950-1:2005+A1:2009+A2:2013 (*Information technology equipment – Safety – Part 1: General requirements).*

The requirements concerning testing laboratories are stated in Appendix 5.

☒ Complete test report.
☒ Documentation showing that the test laboratory fulfil the requirement stated in Appendix 5.

7 Quality of the battery charger

O13 Quality of the battery charger

If the rechargeable batteries are sold together with a charger, the charger must fulfil the following requirements:

Testing of the charger: the quality of the charger must be tested by a testing laboratory that is impartial and fulfils the general requirements applicable to the test institutions provided for in the “Analysis laboratory/test institution” chapter in appendix 5.

C = The maximum capacity (expressed as mAh) specified on the batteries that the charger is sold with.

The reference charge is defined as a constant charge at 1C, cut off at $-\Delta V = 5$ mV/cell.

Discharge to the cut-off requirement of 1 V/cell.

The resting time is set at 20 minutes between each cycle of charge/discharge and discharge/charge.

Condition of battery and termination of charged capacity at 7 cycles:

Cycle 1	Residual Discharge	C/5
Cycle 2-5	Conditioning	1C
Cycle 6	Determining reference charge	1C
Cycle 7	Charging of battery in charger	

Cycles 1-6 to be performed in equipment for testing rechargeable batteries.

The charging phase is registered in cycles 6 and 7 to determine the charged capacity for the reference charger and the test charger.

After 7 cycles the average trickle charge and no-load current for the charger are measured.

The measurement must produce the following results:

- The charger must automatically stop charging when the battery is fully charged. Fully charged is defined as a reference charge with a cut-off of $-\Delta V = 5$ mV + 10%.
- The maximum trickle charge current must on average be < C/20, based on the lowest battery capacity that the charger is recommended to charge by the dealer.
- The maximum no-load current must on average be < C/50, based on the lowest battery capacity that the charger is recommended to charge by the dealer.

The requirements concerning test laboratories are stated in Appendix 5.

✉ Complete test report.
✉ Documentation showing that the test laboratory fulfil the requirement stated in Appendix 5.

8 Consumer information

O14 Consumer information on the battery and portable charger

Battery:

The battery (or battery pack) must be marked in accordance with EN 61951-2 (NiMH) or EN 61960 (Lithium).

The batteries must carry a clear indication of their capacity, in accordance with the requirements applicable to capacity labelling provided for in the EU's Battery Directive 2006/66/EC and regulation (EU) 1103/2010 on the capacity marking of portable rechargeable batteries.

"Clear indication" means that the capacity labelling shall be expressed in terms of a unit (mAh) and that other numerical markings on the battery must not be such that the customer is likely to be misled into thinking that they represent the capacity labelling.

In addition, the battery (or battery pack) must be marked with an international recycling symbol, as given in ISO 7000 (graphical symbols for use on equipment), and specify the cell chemistry of the battery (e.g. Li-ion, Ni-MH).

This symbol must be colour-coded in accordance with the recommendations of the Battery Association of Japan[3] or the draft IEC 62902 standard (Secondary batteries: Marking symbols for identification of their chemistry):

Portable charger:

Portable chargers must be supplied with the following safety information:

a) Minimum instructions for use as specified below:
   - The portable charger (power bank) will generate heat when charging. Always charge in a well-ventilated area. Do not charge under pillows, blankets or on flammable surfaces.
   - Keep the portable charger away from heat sources, direct sunlight, combustible gas, humidity, water or other liquids.
   - Do not dismantle, open, microwave, incinerate, paint or insert foreign objects into the portable charger.
   - Do not subject the power bank to mechanical shock such as crushing, bending, puncturing or shredding. Avoid dropping or placing heavy objects on the portable charger.
   - Do not short-circuit the portable charger or store it in a receptacle where it may be short-circuited by other metallic or conductive objects.
   - Do not operate the portable charger if it has been wet or otherwise damaged, so as to avoid electric shock, explosion and/or injury. Contact the dealer or authorised agent.
   - Portable charger usage by children should be supervised.
   - Please read the operating instructions (including charging instructions and information on the minimum and maximum operating temperatures) supplied with this portable charger.

b) Instructions on how to charge the portable charger.

c) Information on the minimum and maximum operating temperatures for the portable charger.

✉ A sample of the information provided on the battery.
✉ A sample of the safety information supplied with the portable charger.

[3] Battery Association of Japan, Recycling portable rechargeable batteries, http://www.baj.or.jp/e/recycle/recycle04.html (visited 24-11-2017).

9 Design of the portable charger

O15 Recyclable design of the portable charger

The portable charger must be designed in such a way that dismantling is possible. The requirement consists of the following individual requirements:

- A qualified professional, working alone, must be able to dismantle the product.
- It must be possible to separate the substances, preparations and components listed in ANNEX VII of the WEEE Directive (2012/19/EU).
- It must be possible to remove the secondary batteries/cells for recycling purposes.
- The battery/cell chemicals must be prevented from leaking during the removal.

✉ Declaration from the manufacturer of the portable charger showing that the requirements are met. Appendix 2 may be used.

10 Requirements of the authorities and quality requirements

To ensure that Nordic Ecolabelling requirements are fulfilled, the following procedures must be implemented.

O16 Responsible person and organisation

The company shall appoint individuals who are responsible for ensuring the fulfilment of the Nordic Ecolabelling requirements, for marketing and for finance, as well as a contact person for communication with Nordic Ecolabelling.

✉ Organisational chart showing who is responsible for the above.

O17 Documentation

The licensee must archive the documentation that is sent in with the application, or in a similar way maintain information in the Nordic Ecolabelling data system.

🔍 To be checked on site as necessary.

O18 Quality of rechargeable batteries and portable charger

The licensee must guarantee that the quality of the Nordic Swan Ecolabelled product does not deteriorate during the term of validity of the licence.

✉ Procedures for archiving claims and, where necessary, dealing with claims and complaints regarding the quality of the Nordic Swan Ecolabelled rechargeable batteries and portable chargers.

🔍 The claims archive is checked on site.

O19 Planned changes

Written notice must be given to Nordic Ecolabelling of planned changes in products and markets that have a bearing on Nordic Ecolabelling requirements.

✉ Procedures detailing how planned changes in products and markets are handled.

O20 Unplanned nonconformities

Unplanned nonconformities that have a bearing on Nordic Ecolabelling requirements must be reported to Nordic Ecolabelling in writing and journalised.

☒ Procedures detailing how unplanned nonconformities are handled.

O21 Traceability

The licensee must be able to trace the Nordic Swan Ecolabelled rechargeable batteries and portable chargers in production.

☒ Description of/procedures for the fulfilment of the requirement.

O22 Legislation and regulations

The licensee shall ensure compliance with all applicable local laws and provisions at all production facilities for the Nordic Swan Ecolabelled product, e.g. with regard to safety, the working environment, environmental legislation and site-specific terms/permits.

☒ Duly signed application form.

Regulations for the Nordic Ecolabelling of products

When the Nordic Swan Ecolabel is used on products, the licence number shall be included.

More information on graphical guidelines, regulations and fees can be found at www.nordic-ecolabel.org/regulations/

Follow-up inspections

Nordic Ecolabelling may decide to check whether rechargeable batteries or portable chargers fulfils Nordic Ecolabelling requirements during the licence period. This may involve a site visit, random sampling or similar test.

The licence may be revoked if it is evident that rechargeable batteries or portable chargers do not meet the requirements.

History of the criteria

Nordic Ecolabelling adopted version 5.0 of the criteria for rechargeable batteries and portable chargers on DAY MONTH YEAR. The criteria are valid until DAY MONTH YEAR.

New criteria

As part of any future evaluation of the criteria, it will be relevant to consider the following:

- The product definition – new types of rechargeable batteries.
- The possibility of imposing further requirements on constituent substances, particularly heavy metals and the use of solvents in the production of batteries.
- The possibility of imposing requirements concerning the sourcing of conflict-free minerals and critical raw materials.
- Requirements for electrical testing – battery capacity, durability of the battery and portable charger.
- Requirements concerning safety.

Terms and definitions

Term	Explanation or definition
AC input	Direct integrated plug to the power outlet. Designed for “stationary” charging and therefore not portable.
DC output	Direct current (DC) is the unidirectional flow of an electrical charge. A battery is a good example of a DC power supply.
DoD	Depth of Discharge.
EEE	Electrical and Electronic Equipment.
Li-ion	Lithium-ion.
mAh or Ah	Milliamp hours or amp hours: the amount of power expected over time. The higher the number, the greater the capacity. This is the electrical charge (current) that passes through a specific circuit in one hour.
NiMH	Nickel-metal hydride battery.
OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas	For more information: http://www.oecd.org/corporate/mne/mining.htm
PCB	Printed circuit board.
Primary packaging	Refers to the purchase packaging for the consumer, e.g. the packaging that holds 4 batteries or one portable charger, and what the consumer encounters in sales.
Secondary packaging	Refers to the transport packaging and protects the packs of batteries and portable chargers during transport to stores and consumers.
SLI batteries	Batteries used for vehicle starting, lighting and ignition systems.
SWCNT	Single-walled carbon nanotube.
UPS	Uninterruptible power supply (UPS) systems.
USB ports	A USB port is a standard cable connection interface for e.g. personal computers and consumer electronics devices. They can also supply electric power across the cable to devices that require it.
WEEE	Waste Electrical and Electronic Equipment.
Wh-Watt hours	A measure of electrical energy equivalent to power consumption of one watt for one hour. A simple way to determine the current delivered by the power bank is to divide the watts by the voltage rating of the device. Electrical power is measured in watts and power equals the voltage multiplied by the current (amp).

Appendix 1 Description of the rechargeable battery/portable charger, material composition and production

Product: Brand/trading name(s):	
Name and contact details of production location(s) for the manufacture and brand owner(s) of batteries and/or portable chargers:	

For each battery type, list the chemical composition, the weight-% and function of each ingoing substance (detailing all constituent substances present in the battery; metals, other solid substances and liquid chemical substances) in the application (weight-%):

Substance:	**Product name:**							**Function:**
		Weight g	**Concentration of total weight-%**	**Weight g**	**Concentration of total weight-%**	**Weight g**	**Concentration of total weight-%**	

Description of raw materials used in the casing of the battery charger or the portable charger:

____

Description of materials used in the primary packaging:

Primary packaging: refers to the purchase packaging for the consumer, e.g. the packaging that holds 4 batteries or one portable charger, and which the consumer encounters in sales.

Description of manufacturing process of the product:

Charged battery (O10):

I hereby declare that the battery is fully charged when it leaves the production site.

Applicant's or manufactures signature:

Date:	Company Name:
Responsible person:	Responsible persons signature::

Appendix 2 Battery charger and portable charger

If you are applying for battery charger, fill in part A and part B below. If you are applying for portable charger, fill in part A and part C below.

Name/type of battery charger or portable charger:	
Manufacturer of the battery charger or portable charger:	

A. Plastic and metal in the casing of the battery charger and portable charger (O3):

The requirement solely applies to plastic and metal in the casing of the battery charger and the outer casing that encircles the batteries/cells in the portable charger. The requirement does not apply to the battery, the casing encircling the battery/cell itself, circuit/PCBs, wires or USB/charge ports.

Plastic:

Does the casing of the battery charger or portable charger consist of plastic parts covering a surface > 200 m^2? Yes ☐ No ☐

If yes, is the plastic part labelled in accordance with ISO 11469? Yes ☐ No ☐

Does the plastic contain chlorinated plastic? Yes ☐ No ☐

Have cadmium and lead actively been added to the plastic in the casing? Yes ☐ No ☐

Have chloro-paraffins actively been added to the plastic in the casing? Yes ☐ No ☐

Have the following flame retardants been added to the plastic in the casing?

a) Hexabromocyclodecane (HBCDD), tetrabromobisphenol A (TBBP-A) and tris(2-chloroethyl)phosphate (TCEP)? Yes ☐ No ☐

b) Other halogenated organic flame retardants and flame retardants that have been given one or several of the following risk phrases may not be added:
   - H350
   - H350i
   - H340
   - H360D
   - H360F
   - H360Df
   - H360Fd

Metal:

Have the following metals actively been added to the plastic in the casing: Lead (Pb), mercury (Hg), chromium VI (CrVI), cadmium (Cd), cobalt (Co), antimony (Sb), zinc (Zn,), copper (Cu) or nickel (Ni)? Yes ☐ No ☐

Manufacture of the battery charger or portable charger signature:

Date:	Company Name:
Responsible person:	Responsible persons signature::

B. Battery charger (O4)

The requirement applies solely to chargers for rechargeable batteries of the following sizes: AAA: HR03, AA: HR6, C: HR14, D: HR20, 9V: HR 22.

I hereby declare that the charger is suitable for use with a minimum of two battery sizes.

Manufacture of the battery charger signature:

Date:	Company Name:
Responsible person:	Responsible persons signature::

C. Recyclable design of the portable charger (O15)

The portable charger must be designed in such a way that dismantling is possible.

I hereby declare that:
- A qualified professional, working alone, is able to dismantle the portable charger.
- It is possible to separate the substances, preparations and components according to ANNEX VII of the WEEE Directive (2012/19/EU).
- It is possible to remove the secondary batteries/cells for recycling purposes.
- The battery/cell chemicals is prevented from leaking during the removal of the battery/cell(s).
-

Manufacturer of the portable charger signature:

Date:	Company Name:
Responsible person:	Responsible persons signature::

Appendix 3 List of critical raw materials

Raw materials	Main producers (2010, 2011, 2012) End-of-life recycling input rate**	Main sources of imports into the EU (mainly 2012)	Substitutability index*	End-of-life recycling input rate**
Antimony (Stibium)	China 86%	China 92% (unwrought and powdered)	0.62	11%
	Bolivia 3%	Vietnam (unwrought and powdered) 3%		
	Tajikistan 3%	Kyrgyzstan 2% (unwrought and powdered); Russia 2% (unwrought and powdered)		
Beryllium	USA 90%	USA, China and Mozambique[4]	0.85	19%
	China 9%			
	Mozambique 1%			
Borates	Turkey 41%	Turkey 98% (natural borates) and 86% (refined borates)	0.88	0%
	USA 33%	USA 6%, Peru 2% (refined borates); Argentina 2% (natural borates)		
Chromium	South Africa 43%	South Africa 80%	0.96	13%
	Kazakhstan 20%	Turkey 16%		
	India 13%	Others 4%		
Cobalt (Cobaltum)	DRC 56% ↑	Russia 96% (cobalt ores, cobalt and concentrates)	0.71	16%
	China 6%; Russia 6%; Zambia 6%	USA 3% (cobalt ores and concentrates)		
Fluorspar (Fluorite)	China 56%	Mexico 48% ↑	0.80	0%
	Mexico 18%	China 13% ↓		
	Mongolia 7%	South Africa 12% ↓		
Gallium[5]	China 69% (refined)	USA 49%	0.60	0%
	Germany 10% (refined)	China 39%		
	Kazakhstan 6% (refined)	Hong Kong 8%		
Germanium	China 59% ↓	China 47% ↓	0.86	0%
	Canada 17%	USA 35%		
	USA 15%	Russia 14%		
Indium	China 58%	China 24% ↓	0.82	0%
	Japan 10%	Hong Kong 19% ↑		
	Korea 10%	Canada 13%		
	Canada 10%	Japan 11%		
Magnesite	China 69%	Turkey 91%	0.72	0%
	Russia 6%; Slovakia 6%	China 8%		

[4] Subject to strong fluctuations.
[5] Gallium is a by-product; the best available data refer to production capacity, not to production as such.

Magnesium	China 86% ↑	China 91% ↓	0.64	14%
	Russia 5%	Israel 5%		
	Israel 4%	Russia 2%		
Natural graphite	China 68%	China 57% ↓	0.72	0%
	India 14%	Brazil 15%		
	Brazil 7%	Norway 9%		
Niobium	Brazil 92%	Brazil 86% (FerroNiobium)	0.69	11%
	Canada 7%	Canada 14% (FerroNiobium)		
Phosphate rock	China 38%	Morocco 33%	0.98	0%
	USA 17%	Algeria 13%		
	Morocco 15%	Russia 11%		
Platinum Group Metals	South Africa 61% ↓	South Africa 32% ↓	0.83	35%
	Russia 27% ↑	USA, 22% ↑		
	Zimbabwe 5%	Russia 19% ↓		
Heavy Rare Earth Elements	China 99%	China 41% (all REEs) Russia 35% (all REEs) USA 17% (all REEs)	0.77	0%
	Australia 1%			
Light Rare Earth Elements	China 87%		0.67	0%
	USA 7%			
	Australia 3%			
Silicon metal (Silicium)	China 56%	Norway 38%	0.81	0%
	Brazil 11%	Brazil 24%		
	USA 8%; Norway 8%	China 8%		
	France 6%	Russia 7%		
Tungsten (Wolframium)	China 85%	Russia 98% ↑	0.70	37%
	Russia 4%	Bolivia 2%		
	Bolivia 2%			

(*) The “Substitutability index” is a measure of the difficulty in substituting the material, scored and weighted across all applications. Values are between 0 and 1, with 1 being the least substitutable.

(**) The “End-of-life recycling input rate” measures the proportion of metal and metal products that are produced from end-of-life scrap and other metal-bearing low-grade residues in end-of-life scrap worldwide.

Appendix 4 Packaging

Name of the applicant or brand owner:	

Definitions:

Primary packaging: refers to the purchase packaging for the consumer, e.g. the packaging that holds four batteries or one portable charger, and which the consumer encounters in sales.

Secondary packaging: refers to the transport packaging and protects the packs of batteries and portable chargers during transport to stores and consumers.

Post-consumer material is defined in accordance with ISO 14021: "Post-consumer/commercial" is defined as material created by households or commercial, industrial or institutional facilities in the role of end users of a product, which can no longer be used for the intended purpose. This includes return of material from the distribution chain.

Description of materials used in the primary and secondary product packaging:

____
____
____
____
____

I hereby declare that:

- chlorine-based plastic is not used in the primary and secondary product packaging.
- the total proportion of post-consumer recycled material in the primary packaging for the batteries is at least 80% by weight.

Applicant or brand owner signature:

Date:	Company Name:
Responsible person:	Responsible persons signature::

Appendix 5 Analysis and testing laboratories

Testing of quality specifications must be performed by laboratories, which are accredited to the current standard and fulfil the general requirements in the standard EN ISO/IEC 17025 or have official GLP status. A non-accredited laboratory may perform tests if the laboratory has applied for accreditation according to the current testing method, but has not yet been granted approval, or if accreditation is not available for the technical specification or proposed standard. In such case, the laboratory must prove that it is an independent, competent laboratory.

The manufacturer's analysis laboratory/test procedure may be approved for analysis and testing if:

- Sampling and analysis are monitored by the authorities; or
- The manufacturer's quality assurance system covers analyses and sampling and is certified to ISO 9001; or
- The manufacturer can demonstrate agreement between a first-time test conducted at the manufacturer's own laboratory, and testing carried out in parallel at an independent test institute, and the manufacturer takes samples in accordance with a fixed sampling schedule.

Determination of battery durability for NiMH batteries and cells

Preparation of the test

1. Determination of the rated capacity (C) in accordance with EN 61951-2, paragraph 7.3.2 “Discharge performance at 20°C (rated capacity)” at an ambient temperature of 20 °C.
2. Determination or specification of the nominal capacity (N).
3. Full discharge of the battery to the end-of-discharge voltage.

Performance of the tests

1. The tests must carried out on a minimum of three batteries, in accordance with the sample size specified in EN 61951-2. All three batteries must meet the requirements listed therein.
2. Charge and discharge currents, ambient temperature and the respective periods of rest must be carried out in accordance with 61951-2, paragraph 7.5.1 “Endurance in cycles at a rate of 0.2 I_t A”.

Charge cycle test

The battery must be tested and comply with paragraph 7.5.1 (endurance in cycles) of EN 61951-2.
The charge and discharge process must be repeated (at 1.) at least until the total quantities of electricity delivered (Q_i) reach at least 400 times the amount of the nominal capacity (N):

$$\sum_{i=1}^{n} Q1 \geq 400 * N(Ah)$$

During the test cycle, the quantities of electricity delivered (Q_i) may not fall below 75% of the original nominal capacity (N). Otherwise, the test will be considered to have been failed. The following will thus apply to each cycle i:

$Q_i \geq 75\% * N$; $i = \{1, \ldots, n\}$

Determination of remaining capacity

Following performance of the cycle test described above, the battery's remaining capacity (Q_{Rem}) must be determined:

1. Maximum charging of the battery according to the manufacturer's specifications.
2. Period of rest after charge.
3. Discharge of the battery to the end-of-discharge voltage.
4. During discharge: measurement of the quantity of electricity delivered. This quantity of charge recovered is called the remaining capacity (Q_{Rem}).

To comply with the requirements for the award of the Nordic Swan Ecolabel the remaining capacity (Q_{Rem}) thus measured must be at least 80% of the original nominal capacity (N):

$Q_{Rem} \geq 80\% * N$.

Compliance with this requirement will also be a prerequisite for determining the number of full charge cycles, as described below.

Determination of the number of full charge cycles

To determine the number of full charge cycles, the remaining capacity (Q_{Rem}) after the cycle test described above must be at least 80% of the original nominal capacity (N) (see the preceding condition). The number of full charge cycles shall be calculated as the quotient of the total quantities of electricity delivered, as achieved in the cycle test (Q_i), and the nominal capacity:

$$\text{Full charge cycles} = \frac{\sum_{i=1}^{n} Qi}{N}$$

Simplified calculation rule

If the number of charge cycles that can be reached by the battery has been performed using a cycle test according to EN 61951-2 paragraph 7.5 (Endurance in Cycles), or a comparable method providing for a cyclic maximum charging of the battery and the discharge of the battery to the end-of-discharge voltage, a simplified calculation method can be used to calculate the number of full charge cycles. In this case too, the method can only be used if, following performance of the cycle test, the remaining capacity (Q_{Rem}) amounts to at least 80% of the original nominal capacity (N).

The number of full charge cycles can be calculated in a simplified way by multiplying the number of charge cycles achieved by the cycle test by the quotient of the average quantity of electricity delivered ($Q_{i\_average}$) and nominal capacity (N):

$$Full\ charge\ cycles = Charge\ cycles * \frac{Qi\_average}{N}$$

Determination of battery durability for Li-ion/LiP batteries and cells

The following definitions are used to determine battery durability:

Rated capacity (C): quantity of electricity (in ampere hours) declared by the manufacturer of the cells which a single cell or composite cell can deliver during a 5-hour period when charged, stored and discharged according to the conditions specified in paragraph 7.3.1 of EN 61960-3.

Nominal capacity (N): quantity of electricity (in ampere hours), as declared by the manufacturer of the battery or battery pack on the battery and in the product documents, that is stored in the battery and can be delivered by it at a discharge current specified by the manufacturer. The nominal capacity normally equals the rated capacity. The manufacturer may, however, give a value lower than the rated capacity.

Remaining capacity (Q_{Rem}): the quantity of electricity that can be withdrawn from the charged battery ("Full Charge Capacity" according to Battery System Specifications) after performing the charge cycle test for determination of the number of achievable full charge cycles (see below). The remaining capacity decreases due to cyclisation of the battery.

Charge cycle: based on the EN 61960-3 standard, a charge cycle means the charging of a battery according to the manufacturer's specifications, and the subsequent discharge to the end-of-discharge voltage.

Full charge cycle: a full charge cycle means the charging of a battery and the withdrawal of a quantity of electricity (in ampere hours) from the amount of its nominal capacity (N). The difference between a full charge cycle and the charge cycle under EN 61960-3 is that a charge cycle is not defined by reaching the end-of-discharge voltage, but by the quantity of energy withdrawn, which is specified by the nominal capacity (N). A full charge cycle can require more (or less) than one charge cycle.

Preparation of the test

1. Determination of the rated capacity (C) in accordance with EN 61960-3, paragraph 7.3.1 "Discharge performance at 20°C (rated capacity)" at an ambient temperature of 20°C.
2. Determination or specification of the nominal capacity (N).
3. Full discharge of the battery to the end-of-discharge voltage.

Performance of the tests

1. The tests must be performed on a minimum of three batteries in accordance with the sample size specified in EN 61960-3. All three batteries must meet the requirements listed therein.

2. Charge and discharge currents, ambient temperature and the respective periods of rest must be carried out in accordance with EN 61960-3, paragraph „7.6.2 "Endurance in cycles at a rate of 0.2 I_t A".

Charge cycle test

1. Charging of the battery:
2. Period of rest after charge:
3. Discharging of the battery:
4. During discharge: measurement of the quantity of electricity delivered (Q_i).
5. Period of rest after discharge.

The charge and discharge process must be repeated (at 1.) at least until the total quantities of electricity delivered (Q_i) reach at least 500 times the amount of the nominal capacity (N):

$$\sum_{i=1}^{n} Q_i \geq 500 * N \ [Ah]$$

During the test cycle the quantities of electricity delivered (Q_i) may not fall below 75% of the original nominal capacity (N). Otherwise, the test will be considered to have been failed. This means that the following will apply to each cycle i:

$Q_i \geq 75\% * N \; ; i = \{1, \ldots, n\}$

Determination of the remaining capacity

Following the performance of the cycle test described above, the battery's remaining capacity (Q_{Rem}) must be determined:

1. Maximum charging of the battery according to the manufacturer's specifications.
2. Period of rest after charge.
3. Discharge of the battery to the end-of-discharge voltage.
4. During discharge: measurement of the quantity of electricity delivered. This quantity of charge recovered is called the remaining capacity (Q_{Rem}).

For compliance with the requirements for awarding of the Nordic Swan Ecolabel, the remaining capacity (Q_{Rem}) thus measured must be at least 90% of the original nominal capacity (N):

$Q_{Rem} \geq 90\% * N$.

Compliance with this requirement will also be a prerequisite for determining the number of full charge cycles, as described below.

Determination of the number of full charge cycles

To determine the number of full charge cycles, the remaining capacity (Q_{Rem}) after the cycle test described above must be at least 90% of the original nominal capacity (N) (see the preceding condition). The number of full charge cycles must shall be calculated as the quotient of the total quantities of electricity delivered that has been achieved in the cycle test (Q_i), and the nominal capacity:

$$\text{Full charge cycles} = \frac{\sum_{i=1}^{n} Qi}{N}$$

Simplified calculation rule

If the number of charge cycles that can be achieved by the battery has been performed using a cycle test according to EN 61960-3 paragraph 7.6 (Endurance in Cycles), or a comparable method providing for a cyclic maximum charging of the battery and the discharge of the battery to the end-of-discharge voltage, a simplified calculation method can be used to calculate the number of full charge cycles. In this case too, the method can only be used if, following performance of the cycle test, the remaining capacity (Q_{Rem}) amounts to at least 90% of the original nominal capacity (N).

The number of full charge cycles can be calculated in a simplified way by multiplying the number of charge cycles achieved by the cycle test by the quotient of the average quantity of electricity delivered ($Q_{i\_average}$) and nominal capacity (N):

$$\text{Full charge cycles} = \text{Charge cycles} * \frac{Qi\_average}{N}$$