



Swan labelling of  
**Toner Cartridges**

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**Nordic Ecolabelling**

In November 1989, the Nordic Council of Ministers adopted a measure to implement an official voluntary ecolabelling scheme, the Swan. The organizations/companies listed below administer the Swan ecolabelling schemes on assignment from their national governments.

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This document is a translation of an original in Swedish. In case of dispute, the original document should be taken as authoritative.

# Swan labelling of Toner Cartridges

008/Version 4.0, October 2005

<b>What is a Swan-labelled toner cartridge? .....</b>	<b>1</b>
<b>Why choose the Swan label? .....</b>	<b>2</b>
<b>What can carry the Swan label? .....</b>	<b>2</b>
<b>How to apply .....</b>	<b>3</b>
<b>What are the requirements of Swan labelling? .....</b>	<b>4</b>
<b>1 Environmental requirements.....</b>	<b>4</b>
1.1 Toner powder	4
1.2 Recycling	5
1.3 Quality	6
1.4 Material requirements	7
1.5 Other requirements	8
<b>2 Quality and regulatory requirements .....</b>	<b>9</b>
<b>3 Marketing.....</b>	<b>10</b>
<b>Design of the Swan label .....</b>	<b>11</b>
<b>Follow-up inspections .....</b>	<b>11</b>
<b>How long is a licence valid?.....</b>	<b>11</b>
<b>New criteria.....</b>	<b>12</b>

## Appendices

1. Criteria for environmental hazard
2. Declaration of components in toner powder
3. Proposal for yearly reports
4. Test methods
5. Declaration from manufacturer of toner cartridges (chlorinated plastics)
6. Marketing of Swan-labelled toner cartridges
7. Proposal of information to customers, distributors and re-sellers regarding the use of the Swan label



## What is a Swan-labelled toner cartridge?

The majority of laser printers and copying machines, and many fax machines, use toner cartridges. Cartridges contain toner powder and a drum. When a cartridge is empty, it is either disposed of or collected as part of various take-back systems.

Swan-labelled toner cartridges are remanufactured, refilled cartridges, drum units or powder containers. They are used for black and white and colour printing in printers and copying machines.

Swan-labelled toner cartridges mean:

- Less waste and a lower consumption of energy and raw materials. Using toner cartridges several times reduces the total consumption of toner cartridges and accordingly the environmental impact of the product throughout its service life.
- The criteria aim to reduce waste but also place requirements on product quality, quality assurance of the recycling process, content of environmentally hazardous and harmful substances, and labelling and customer information.

*In the case of recycled toner cartridges, the production of the original toner cartridge lies outside the control of the licensee. Accordingly we do not impose any requirements on the original toner cartridge.*

Remanufacturing and refilling toner cartridges/OPC units/toner-powder containers reduces levels of waste, at the same time as lowering energy use and the consumption of raw materials. Using toner cartridges several times reduces the total consumption of toner cartridges and accordingly the environmental impact of the product throughout its service life.

Recycling means that used, original toner cartridges, or previously remanufactured and refilled cartridges are collected, dismantled, cleaned, checked/repared, refilled with toner powder and then reassembled. The drum is changed frequently to ensure the quality of printouts and, in some cases, to extend the service life of the toner cartridge.

The background document regarding the Swan labelling of toner cartridges explains the reasoning behind each requirement. The background document can be ordered from Nordic Ecolabelling.

## Why choose the Swan label?

- Companies trading remanufactured and refilled toner cartridges may use the Swan trademark for marketing. The Swan label is a very well-known and well-reputed trademark in the Nordic region.
- The Swan label is a cost-effective and simple way of communicating environmental work and commitment to customers and suppliers.
- Reducing environmental impact often creates scope for lowering costs, such as by cutting the consumption of energy and purchase of raw materials, and reducing amounts of packaging and waste.
- Environmental issues are complex. It can take a long time and extensive resources to gain an understanding of a specific area. Swan labelling can be seen as an aid in this work.
- The Swan label not only covers environmental issues but also quality requirements, since the environment and quality often go hand in hand. This means that a Swan licence can also be seen as a mark of quality.

## What can carry the Swan label?

Toner cartridges that may carry the Swan label are remanufactured and refilled containers comprising toner powder, drum and necessary operational mechanism. The cartridges are used for black and white and colour electrophotographic (Xerographic) printing and similar reproduction processes. In this document, cartridge also refers to toner cartridges.

These criteria also cover remanufactured cartridges where the toner powder is delivered in a separate container. In this case, the text under the ecolabel shall read "Recycled drum unit or OPC unit".

*OPC - Optical Photosensitive Conductor*

Remanufactured and refilled containers that only contain toner powder can also be Swan labelled. In this case, the text under the ecolabel shall read "Recycled toner powder container".




For the Swan labelling of OEM cartridges, please refer to the criteria for copying machines, printers, fax machines and multifunctional devices.

## How to apply

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

### Icons in the text

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 or on request.
-  Enclose procedures from the company's environmental management and quality control systems.

### Application

The application shall be sent to Nordic Ecolabelling in the country in which the toner cartridges are sold. See page two for addresses.

The documents required for application are an application form and documentation demonstrating fulfilment of the requirements (specified in the criteria).

Further information and assistance may be available. Visit the Web site of the national ecolabelling body for more information, such as the contact at each Nordic Ecolabelling office. See also page two.

### Sales in other Nordic countries

To be sold in Nordic countries other than the country of application, the Swan-labelled toner cartridges must first be registered in that country.

The following must be submitted to Nordic Ecolabelling:

- Registration form for sales in the country in question.
- Copy of a valid licence.
- Examples in the relevant language of labelling and information as per R12.
- Documentation detailing for which recycling system the cartridges are designed, as per R5.

Registration is free of charge but an annual fee shall be paid in accordance with the national regulations.

## On-site inspection

During the application process, Nordic Ecolabelling performs an on-site inspection of production to ensure adherence to the requirements. For this 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. The cost of this inspection is included in Nordic Ecolabelling's licence fee.



## Costs

An application fee is charged to companies applying for a licence. There is an additional annual fee based on the revenues produced by the Swan-labelled toner cartridges. Please refer to the national Web site for more information, see page 2.

## Enquiries

Please contact Nordic Ecolabelling if you have any queries or require further information. See page 2 for addresses.

# What are the requirements of Swan labelling?

Applications must be submitted along with the documents specified under each requirement in sections 1 and 2 (icons  and .

The background document regarding the Swan labelling of toner cartridges explains the reasoning behind each requirement. This background document can be ordered from Nordic Ecolabelling.


## 1 Environmental requirements

### 1.1 Toner powder

#### R1 Environmentally hazardous substances

The toner powder must not contain in excess of 2% by weight of substances classified as hazardous to the environment in accordance with regulations in a Nordic country or in accordance with EU Directive 67/548/EEC with adaptations. See Appendix 1.

The chemicals supplier is responsible for the classification of the chemical products. Nordic Ecolabelling may request to verify documents used in classification.

-  Appendix 2 and a complete list of contents (e.g. 16-item product data sheet) in which all constituent substances are individually specified, including CAS numbers and information on which substances are classified as environmentally hazardous.

**R2 Health hazards**

Toner powder classified as carcinogenic, reproduction toxic, toxic or very toxic according to regulations in any Nordic country must not be present in the product<sup>1</sup>.

- 16-item product information sheet with health hazard classification.

**R3 Information on health hazards**

The end-user of the cartridge must be furnished with clear, simple information on how to handle the cartridge and deal with any loose toner powder that may be present, such as due to damage.

- Copy of the information provided to the end-user.

## 1.2 Recycling

**R4 Re-use**

Used cartridges or toner powder containers shall be collected, cleaned, checked/repaired and refilled with new toner powder. 75% by weight shall consist of recycled parts.

*The weight of the toner powder shall not be included in this total weight.*

- Specification of the proportion by weight of recycled parts in each cartridge type and which parts are changed during remanufacturing and refilling. Mass balance data shall be submitted annually to Nordic Ecolabelling, see Appendix 3.

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<sup>1</sup> In Denmark toner powder containing quantities in excess of 0.1% of respirable dust of Carbon Black with CAS. No. 133-8-4 is subject to the Danish Working Environment Authority's "Bekendtgørelse nr. 908 af 27. september 2002, om foranstaltninger for forebyggelse af kreftrisiko ved arbejde med stoffer og materialer." Nevertheless, this toner powder may be used if it is processed in a closed system or in some other way that eliminates the risk of dust emissions.

**R5 Take-back system**

To ensure that the products are returned for further recycling, a cartridge take-back system must be in place. The performance of this system shall be documented.

The take-back system shall include one or several of the following measures and apply to all types of customer:

- deposit system
- prepaid address label or packaging for return supplied with the product
- agreement between manufacturer and distributors
- collection boxes with prepaid address labels located at customer and reseller premises

Nordic Ecolabelling may approve alternative take-back systems.



Description of the take-back system. The performance of the take-back system shall be reported annually to Nordic Ecolabelling. See Appendix 3.

## 1.3 Quality

**R6 Production quality**

The annual average proportion of complaints relating to Swan-labelled production must not exceed 1%. Only claims relating to Swan criteria shall be included in this calculation.

The proportion of claims shall be calculated on a monthly basis and be used actively to assure and raise the quality of production. If the proportion of claims exceeds 1%, a report shall be submitted detailing the reasons and rectifying actions. If the proportion of claims exceeds 2%, contact Nordic Ecolabelling.



Report of how the company deals with complaints and how these are recorded. The report shall include the types of product complaint, how claims are dealt with, the follow-up of production and contact with Nordic Ecolabelling.

Claims shall be reported annually grouped by type of claim and product. See Appendix 3.

**R7 Performance**

Toner cartridge performance covers print quality, print capacity and toner transfer efficiency. The performance of a Swan-labelled toner cartridge shall match or better that of an Original Equipment Manufacturer (OEM) cartridge of the same type.

The test methods are described in Appendix 4. For applications and the extension of a licence, each cartridge type shall be tested according to Test A+B+C.

During the licence period, the performance of the Swan-labelled cartridge types shall be tested annually according to Test B (see Appendix 4).

If the toner powder and/or the drum is changed during the licence period, the cartridge type shall be tested according to Test C (see Appendix 4).



Test results, including results for equivalent OEM cartridges from the application. Test results must be available during inspection visits.

**R8 Chip information**

The information on a reset chip must correspond to the chip information in an OEM cartridge. If this is not possible, the customer must be provided information on the packaging or in the product information that is supplied with the product.

- Specification of the information on reset chips in Swan-labelled cartridges and the equivalent from OEM cartridges. Example of product information regarding chip information.

## 1.4 Material requirements

**R9 Plastic**

Replacement cartridge parts may not contain chlorinated plastics.

- Declaration from the toner cartridge supplier that the requirement is fulfilled, see Appendix 5.

**R10 PVC packaging**

The product packaging must not contain PVC or other chlorinated plastics.

- Specification of materials used for packaging and product information for the packaging.

**R11 Recycling of packaging**

Packaging components must not consist of mixtures of different materials since this complicates recycling.

- See R10.

## 1.5 Other requirements

### R12 Customer information

The following end-user information requirements must be fulfilled:

- Removal of original toner cartridge label.
- Clear information on the toner cartridge or packaging that the empty cartridge should be sent for recycling (not thrown away). If the cartridge is sold along with packaging for return, this must be specified in the information. It must also be stated that the pre-paid envelope (if provided) can be used for return.
- Information regarding Swan requirements must be provided with the cartridge. This information must state that the cartridge is remanufactured, refilled and quality controlled, and that the purpose of Swan labelling is to reduce waste and assure quality.
- Information regarding warranty, health (see R3) and claims procedures. The information must be provided in an official Nordic language.
- Packaging and instructions must be marked with the Swan label and licence number. If the Swan label is used in other product information/promotional material, the licence number must be included. More information is provided in the marketing section.



Example of labelling (copy or photo) and product information provided to the customer.

### R13 Waste

All waste from production and preceding preliminary sorting facilities must be sorted at source, and the various fractions (e.g. plastic and metal) shall principally be recycled. If there is documented evidence that a fraction cannot be recycled, the fraction must nevertheless be dealt with in an environmentally suitable manner.



The manufacturer must present a plan for waste treatment and sorting at the site of manufacture and sorting facilities.

The plan must include information on how the various fractions are dealt with and which companies the applicant engages for waste handling. The waste plan must also specify any waste fractions that cannot be recycled. Copies of contracts or invoices are accepted as documentation. The applicant must declare whether the waste is classified as environmentally hazardous in accordance with national law/regulations.

## 2 Quality and regulatory requirements

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

### **R14 Laws and regulations**

The licensee must guarantee adherence to safety regulations, working environment legislation, environmental legislation and conditions/concessions specific to the operations at all sites where the Swan-labelled product is manufactured.



Declaration from the licensee that the requirement is met, and the contact details of the regulatory authority.

### **R15 Swan licence officer**

The company shall appoint an officer responsible for ensuring the fulfilment of Swan requirements, and a contact person for communications with Nordic Ecolabelling.



A chart of the company's organizational structure detailing who is responsible for the above.

### **R16 Documentation**

The licensee must be able to present a copy of the application, and factual and calculation data supporting the documents submitted on application (including test reports, documents from suppliers and suchlike).



Checked on site.

### **R17 Planned changes**

Written notice must be given to Nordic Ecolabelling of planned changes that have a bearing on Swan requirements.



Procedures detailing how planned changes are handled.

### **R18 Unplanned nonconformities**

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



Procedures detailing how unplanned nonconformities are handled.

### **R19 Traceability**

The licensee must have a traceability system for the production of the Swan-labelled cartridges.



Description of/procedures for the fulfilment of the requirement.

**R20 Take-back system**

Pertinent national regulations, legislation and/or agreements within the sector regarding the recycling systems for products and packaging shall be met in the Nordic countries in which the Swan-labelled toner cartridges are sold.

- Declaration from the applicant regarding adherence to existing recycling/take-back agreements for the product and packaging.

### 3 Marketing

The Swan label is a very well-known and well-reputed trademark in the Nordic region. Swan-labelled toner cartridges may be marketed using the Swan label so long as the associated licence is valid.

The label must be positioned so that there is no doubt as to what the label refers and so that it is clear that the toner cartridge is ecolabelled.

More information on marketing can be found in "Regulations for Nordic Ecolabelling" of 12 December 2001 or later version.

**R21 Information to resellers and distributors**

The licensee must specify how the regulations regarding the Swan trademark are observed and how the licence information is communicated to direct customers, distributors and resellers. An example of the presentation of information is provided in Appendix 7.

- Appendix 6 and details of how the information is communicated to the company's customers, distributors and resellers.

**R22 Sales outside the Nordic region**

The applicant must specify in which non-Nordic countries the Swan-labelled cartridges are sold. The use of the Swan trademark outside the Nordic region is currently free of charge. However, the product must fulfil all Swan requirements.

- Details of in which non-Nordic countries the Swan-labelled toner cartridges will be sold.

## Design of the Swan label

Design of the Swan label:



Licence number

Each licence has a unique six-digit licence number that must be displayed along with the label.

More information on the design of the label can be found in "Regulations for Nordic Ecolabelling" of 12 December 2001 or later version.

## Follow-up inspections

Nordic Ecolabelling may decide to check whether the toner cartridge fulfils Swan 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 the toner cartridge does not meet the requirements.

Random samples may also be taken in-store and analysed by an independent laboratory or Nordic Ecolabelling. If the requirements are not met, Nordic Ecolabelling may charge the analysis costs to the licensee.

## How long is a licence valid?

Nordic Ecolabelling adopted the criteria for toner cartridges on DAY MONTH YEAR. The criteria are valid until DAY MONTH YEAR.

The 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.

## New criteria

During the next review of the criteria for toner cartridges, planned for approximately three years time, Nordic Ecolabelling will investigate the following areas:

- Whether the quality requirements regarding colour cartridges and the use of chip technology are sufficient.
- Whether the maximum claim level shall apply per product type rather than for all Swan-labelled products collectively.
- Whether there is new technology that can extend the service life of toner cartridges, such as long-life drums and high-capacity cartridges.
- Whether the scope of the product group is correct or whether it should be extended to include other manufacturing methods.
- Whether requirements on chemicals used for treatment of materials during recycling should be introduced.
- Whether work environment requirements regarding the handling of toner powder during recycling should be introduced.

## Appendix 1

### Criteria for environmental hazard

In accordance with regulation 1997:5 of the Swedish National Chemicals Inspectorate and EU Directive 67/548/EEC, 18th Adaptation, a substance is classified as harmful to the aquatic environment if:

1. the substance is very toxic to aquatic organisms and not readily biodegradable or very toxic to aquatic organisms and potentially bioaccumulating.
2. the substance is very toxic to aquatic organisms.
3. the substance is toxic to aquatic organisms and not readily biodegradable or toxic to aquatic organisms and potentially bioaccumulating.
4. the substance is harmful to aquatic organisms and not readily biodegradable.
5. the substance has low solubility in water, is not readily biodegradable and is potentially bioaccumulating.
6. the substance, despite fulfilling criteria 1-5, nevertheless, on the basis of available evidence concerning degradability, predicted or observed behaviour and environmental fate, presents an immediate or long-term danger to the structure and/or function of aquatic ecosystems.

A substance is classified as environmentally hazardous if:

1. the substance, on the basis of available evidence concerning its toxicity, degradability, potential to bioaccumulate, and its predicted or observed behaviour and environmental fate, can present an immediate or long-term danger, to the structure and/or function of other ecosystems than the aquatic environment.

If a substance's products of degradation are environmentally harmful, the original substance shall be classified as environmentally harmful.

For general comments and decisions, refer to regulation 1994:12 and general guidelines 1994:1 of the Swedish National Chemical Inspectorate.

#### Toxicity

A substance is classified as very toxic to aquatic organisms if

Fish	$LC_{50} (96 \text{ hr}) \leq 1 \text{ mg/l}$ <u>or if</u>
Daphnia	$EC_{50} (48 \text{ hr}) \leq 1 \text{ mg/l}$ <u>or if</u>
Algae	$IC_{50} (72 \text{ hr}) \leq 1 \text{ mg/l}$ .

A substance is classified as toxic to aquatic organisms if

Fish	$LC_{50} (96 \text{ hr}) > 1 \text{ mg/l}$ but $\leq 10 \text{ mg/l}$ <u>or if</u>
Daphnia	$EC_{50} (48 \text{ hr}) > 1 \text{ mg/l}$ but $\leq 10 \text{ mg/l}$ <u>or if</u>
Algae	$IC_{50} (72 \text{ hr}) > 1 \text{ mg/l}$ but $\leq 10 \text{ mg/l}$ .

A substance is classified as harmful to aquatic organisms if

Fish	$LC_{50} (96 \text{ hr}) > 10 \text{ mg/l}$ but $\leq 100 \text{ mg/l}$ <u>or if</u>
Daphnia	$EC_{50} (48 \text{ hr}) > 10 \text{ mg/l}$ but $\leq 100 \text{ mg/l}$ <u>or if</u>
Algae	$IC_{50} (72 \text{ hr}) > 10 \text{ mg/l}$ but $\leq 100 \text{ mg/l}$ .

#### Degradation

A substance is considered readily biodegradable if it degrades more than 60% (measured as  $CO_2/BOD$ ) or 70% (measured as DOC) within 28 days. The test shall be carried out according to OECD guidelines.

A substance is also considered readily biodegradable if  $BOD_5/COD \geq 0.5$  or if other convincing scientific evidence is available to demonstrate that the substance can be degraded > 70% in the aquatic environment within 28 days.

#### Bioaccumulation

A substance is considered bioaccumulable if  $BCF \geq 100$  or if  $\log K_{OW} \geq 3$ .

#### Solubility in water

A substance is considered to have low solubility in water if its solubility is < 1 mg/l.

All testing shall be performed in accordance with OECD guidelines.

**Appendix 2****Declaration of substances in toner powder**

Product name: \_\_\_\_\_

Producer/Importer: \_\_\_\_\_

The supplier of chemicals is responsible for the classification of the chemical substances.  
Nordic Ecolabelling may request to verify documents used in classification.

Does the toner powder contain more than 2% by weight of  
substances classified as environmentally hazardous in accordance  
with current regulations in a Nordic country or EU Directive  
67/548/EEC?

YES NO 

If yes, specify which

:

Basis for classification - see Appendix 1. ).

Is the toner powder classified as environmentally hazardous in  
accordance with regulations in any Nordic country?

YES NO 

Environmentally hazardous substances (Chemical name and CAS-no.)	Content, %
Other substances	Content, %
Signature of the supplier	
Date	Company name
Phone	Signature of responsible officer

## Appendix 3

### Proposal for yearly reports

Nordic Ecolabelling primarily requires yearly reports to ensure the quality of the Swan-labelled cartridges. A further important reason is to compile and report the environmental gains of Swan labelling.

This appendix provides a template for the yearly report. An Excel spreadsheet for the yearly report can also be downloaded from the national Web sites (see page 2 for addresses).

### Mass balance

Report as per **R4**

Cartridge type	No. of Swan-labelled cartridges manufactured	Total weight of cartridge excl. toner powder (kg)	Proportion by weight of recycled parts (%)	Total weight of recycled material (kg)
<b>Total:</b>				

### Claims report

Report as per **R6**. Only claims relating to Swan criteria shall be included in the calculation of the annual average.

Cartridge type	Total units sold	No. of claims	Distribution		
			Performance	Print capacity	etc.

## Performance

The following toner cartridges have been tested according to **R7**.

Total number of Swan-labelled toner cartridges covered by valid licence: \_\_\_\_\_

No.	Cartridge type - tested during the year	Cartridge type – testing planned for next year
1		
2		
3		

## Performance of take-back system

Report as per **R5**

<b>A</b>	<b>No. toner cartridges manufactured:</b>	
<b>B</b>	<b>Total no. of toner cartridges collected in company's take-back system</b>	
<b>C</b>	<b>Total no. of own-brand toner cartridges collected in company's take-back system</b>	
	<b>Performance of company's take-back system (B/A):</b>	
	<b>Performance for own-brand take-back system (C/A):</b>	

**Changes to the organisation that influence the licence:**

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**Other comments:**

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## **Appendix 4**

### **Testing and analysis**

All tests shall comply with ASTM F 1531. Alternative test methods may be approved if an independent, competent body judges the test to be equivalent and the test results can be compared to the results of ASTM F 1531. All tests must be carried out in a test environment as described under **T1**.

A licensee/applicant shall test the toner cartridges in question in the following situations:

#### **Test A: Testing on application**

The licence applicant must test all toner cartridge types in question and each OEM toner cartridge before submitting the application to Nordic Ecolabelling. The tests must be less than one year old. Following this, the OEM toner cartridges must be tested at least every third year and compared with the Swan-labelled toner cartridges. The test results shall be filed and made available for follow-up inspection.

Testing shall comply with the test methods in Appendix 4, items **T2-T4**.

#### **Test B: Annual testing**

The licensee must test at least 10% of the Swan-labelled toner cartridges. The most-sold toner cartridge type must be included. The number of types to be tested may be changed by Nordic Ecolabelling, such as on the basis of the claims report.

Testing shall comply with the test methods in Appendix 4, items **T2-T4**.

#### **Test C: Testing of all toner cartridges**

The licensee shall test all Swan-labelled toner cartridges as per Appendix 4, item **T4**.

#### **Test D: Testing in connection with a change of materials**

The licensee shall test a cartridge if the type of toner powder and/or OPC drum is changed.

Testing shall comply with the test methods in Appendix 4, items **T2-T4**.

#### **Test E: Testing on follow-up inspection**

Nordic Ecolabelling may decide to check whether the toner cartridge fulfils Swan requirements during the licence period. This may involve a site visit, random sampling or similar test. Nordic Ecolabelling shall determine the type of test.

#### **T1 Test environment**

All tests shall be conducted at a temperature of 10 - 40°C and 8 – 80% relative humidity. Conditions must be as controlled as possible.

## **T2 Long-term test**

The long-term test shall be conducted using the same method for the remanufactured and refilled toner cartridges in question as for the reference OEM cartridges. The toner cartridges' toner transfer efficiency (see **T3**) is also assessed during long-term testing.

Toner cartridge print quality (**T4**) is also included in this long-term test. This is performed to test quality over an extended period of time for each individual toner cartridge.

Test method for long-term test:

1. Weigh the cartridge and record the weight (a grams).
2. Print and examine five sheets in accordance with **T4**.
3. Print out a quantity of pages corresponding to one-fifth of the expected capacity of the cartridge, with approx. 4% coverage. Use pages with text spread evenly over the page: the letter 'E' or 'k' may for example be repeated in an even pattern over the pages at suitable intervals to achieve approx. 4% coverage.
4. Repeat items 2 and 3 until the cartridge is empty.
5. The printout capacity is the total number of pages printed out in **T2** items 2-4.
6. Weigh the empty cartridge to determine the quantity of toner used during the test and record the weight (b grams).
7. Disassemble the cartridge, weigh the scavenger unit and record the weight (c grams).
8. Clean the scavenger unit, weigh again and record the weight (d grams).

The quantity of toner on the printout is a-b.

The toner remaining in the scavenger unit is c-d.

### **T3 Toner transfer efficiency**

Toner transfer efficiency (TE) is measured during long-term testing (T2) and is calculated as:

$$TE = \left( \frac{\text{quantity of toner on printout}}{\text{quantity of toner on printout} + \text{quantity of toner in scavenger unit}} \right) * 100\%$$

The quantity of toner on the printout is the difference in weight of the cartridge before and after the long-term test.

A theoretical lowest value for the toner transfer efficiency (LTE) is calculated as:

$$LTE = \left( 1 - \frac{\text{scavenger unit capacity}}{\text{toner container capacity}} \right) * 100\%$$

Logs should be kept of the results per cartridge type and submitted to Nordic Ecolabelling with the yearly report.

### **T4 Print quality**

To ensure the high quality of printouts (print density of solid colour and lines) from toner cartridges included in the application, test printouts shall be made for each individual cartridge (and corresponding OEM cartridge) and during long-term testing.

The corresponding OEM cartridge is used as a reference.

The test printout must contain fully covered black areas of at least 20x20 mm distributed throughout the page as well as horizontal and vertical lines with varying line width distributed throughout the page. Samples of text and grey-tones must also be included on the test printout. At least five test pages must be printed out and compared with an equivalent quantity of printouts from the corresponding OEM cartridge.

To avoid breaking the toner powder seal, it is permitted to test a cartridge by applying a small amount of toner powder of the same type and batch as in the cartridge to a transfer roller.

#### **Print density**

A subjective evaluation must be performed of each individual cartridge. The test printout must not, when viewed in daylight or daylight-equivalent illumination, reveal any visible difference in relation to the equivalent printout from the OEM cartridge. The toner powder must be evenly distributed, i.e. no lighter areas in the form of lines or spots must be visible. The print density of the remanufactured cartridge must not be less than that of the original cartridge.

**Print density of lines**

An evaluation of edge sharpness and optical density must be performed for each individual cartridge and in connection with long-term testing. Edges must not deviate more than 0.1 mm. Visible thinning of optical density must not occur in sectors wider than 0.2 mm.

**T5 Choice of test institute**

Sampling must be performed in a competent manner. The laboratory/test institute must be independent and competent. Individual test results must be available for Nordic Ecolabelling.

The laboratory/test institute shall operate in accordance with the EN 45001, or ISO-IEC guide 25. The applicant will bear documentation and analysis costs.

The producer's laboratory may be approved for testing and analysis if the authorities monitor the sampling and analysis, or if the laboratory has been certified to ISO 9001 or ISO 9002. Nordic Ecolabelling may also assess and approve the producer's laboratory and procedures for testing cartridge performance.

## Appendix 5

### Declaration from toner cartridge supplier

We hereby certify that replacement parts in the refilled toner cartridge do not contain chlorinated plastics.

Place: \_\_\_\_\_ Date: \_\_\_\_\_

Company name: \_\_\_\_\_

Signature of contact person: \_\_\_\_\_

Clarification of name: \_\_\_\_\_

## Appendix 6

### Marketing of Swan-labelled toner cartridges

We hereby certify that we are well acquainted with the regulations governing the use of the Swan ecolabel, as detailed in "Regulations for Nordic Ecolabelling" of 12 December 2001 or later version. We agree to follow these regulations when marketing Swan-labelled toner cartridges.

Further, we confirm that we are familiar with the criteria document regarding the Swan labelling of toner cartridges.

We undertake to advise those individuals within the company involved in marketing the Swan-labelled toner cartridges of the criteria for the Swan labelling of toner cartridges and "Regulations for Nordic Ecolabelling" of 12 December 2001 or later version.

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Location and date	Company
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Signature, contact person

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Clarification of signature	Phone
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Signature, marketing manager

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Clarification of signature	Phone
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In case of a change in personnel, a new declaration must be submitted to Nordic Ecolabelling.

## Appendix 7

### Information to resellers and distributors

These guidelines can be used if you wish to make sure that your marketing and sale of Swan-labelled toner cartridges is correct and follows current regulations.

Observe the following:

A manufacturer of Swan-labelled toner cartridges may market both Swan-labelled and non-labelled products. If in any doubt, this can be checked through a valid licence or Nordic Ecolabelling national Web sites.

Always check that the Swan-labelled toner cartridge has a licence number. The licence number guarantees traceability to the licensee and manufacturer. E.g.: 308 001.

**IT IS FORBIDDEN TO SELL TONER CARTRIDGES LACKING A LICENCE NUMBER.**

If the manufacturer of the Swan-labelled cartridges holds a licence in another Nordic country, you may request a certificate of registration to ensure that the licence is valid in the country of sale.

Facts about Swan labelling:

- \* The Swan label is Nordic Ecolabelling's logo. It is a registered, protected trademark.
- \* Nordic Ecolabelling administrates Swan labelling on assignment from the Nordic Council of Ministers. Nordic Ecolabelling has the right to issue and revoke licences for the use of the Swan label on products and services.
- \* The Swan is a voluntary label for manufacturers, who pay for its use.

The following guidelines apply generally to the Swan labelling of products and services:

- \* The right to use the Swan label is demonstrated by a valid licence certificate or, if the product is sold outside the country of application, a certificate of registration.
- \* The licence number and subtext must be displayed adjacent to the Swan label on a product.
- \* The licensee is always responsible for ensuring that the product follows the current criteria.
- \* The reseller of a Swan-labelled product is responsible for ensuring that the Swan label is used according to Nordic Ecolabelling's current regulations and national marketing legislation.

**Visit Nordic Ecolabelling's national Web sites to find out more:**  
Denmark [www.ecolabel.dk](http://www.ecolabel.dk) ; Sweden [www.svanen.nu](http://www.svanen.nu); Norway [www.ecolabel.no](http://www.ecolabel.no)  
Finland [www.ymparistomerkki.fi](http://www.ymparistomerkki.fi); Iceland [www.svanurinn.is](http://www.svanurinn.is)



Licence number (6 digits)



Licence number (6 digits)