

About Nordic Swan Ecolabelled

Digital Photographic Development Services



Version 3.2

**Background to ecolabelling
19 June 2018**

Content

1	Summary	3
2	Basic facts about the criteria	4
2.1	Products that can be labelled	4
2.2	About photographic development	4
2.3	Justification for Nordic Swan Ecolabelling	5
3	About the criteria revision	9
4	Justification of the requirements	10
4.1	The organisation (O1)	10
4.2	Chemicals (O2-O6)	11
4.3	Energy (O7)	16
4.4	Photographic paper (O8-O9)	17
4.5	School photo production (O10)	20
4.6	Waste (O11-12)	22
4.7	Working environment (O13)	23
4.8	Environmental management and regulatory requirements (O14-O26)	23
4.9	Changes in the generation 3	27
5	Changes compared to previous version	27
6	New criteria	30
7	References	30
	Terms and definitions	31

081 Digital Photographic Development Services, version 3.2, 19 June 2018

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

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
Danish Standards Foundation
Göteborg Plads 1
DK-2150 NORDHAVN
Tel. +45 72 300 450
info@ecolabel.dk
www.ecolabel.dk

Finland

Ecolabelling Finland
Urho Kekkosen katu 4-6 E
FI-00100 HELSINKI
Tel. +358 9 61 22 50 00
joutsen@ecolabel.fi
www.ecolabel.fi

Iceland

Ecolabelling Iceland
Umhverfisstofnun
Suðurlandsbraut 24
IS-108 REYKJAVIK
Tel. +354 5 91 20 00
ust@ust.is
www.svanurinn.is

Norway

Ecolabelling Norway
Henrik Ibsens gate 20
NO-0255 OSLO
Tel. +47 24 14 46 00
info@svanemarket.no
www.svanemarket.no

Sweden

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

This document may only be copied in its entirety and without any type of change. It may be quoted from provided that Nordic Ecolabelling is stated as the source.

1 Summary

The purpose of this document is to present the background to the criteria for digital photographic development services.

The document explains why Nordic Ecolabelling has chosen to ecolabel digital photographic development services and gives the background to the individual requirements as they relate to the environmental goals of Nordic Ecolabelling. The requirements are also justified based on the potential environmental gains that ecolabelling digital photographic development services may bring, and the scope for controllability and documentation of the requirements.

The aim of the criteria for ecolabelling digital photographic development services is to help reduce:

- chemicals with ecotoxicological effects
- chemicals that affect human health
- energy consumption
- waste quantities
- use of resources
- environmental load deriving from photographic paper

Nordic Swan Ecolabelled digital photographic development services contribute to low energy consumption and reduced use of chemicals. Chemicals used fulfil strict environmental and health requirements. High requirements are set for waste management and washing water. Good working environment is preferred by treating chemicals in closed systems.

The overall environmental impact of photographic development services has fallen due to the fact that fewer photos are developed nowadays than e.g. 10 years ago. The environmental impact of photographic development has also fallen due to a shift away from film development towards development techniques such as dry lab technology that requires fewer chemicals and lower energy consumption. Photographic development using inkjet technology (dry lab) is expected to replace traditional wet development techniques, but currently constitutes a small part of the market. Nordic Ecolabelling wishes primarily to favour/steer branch to techniques with less environmental impact. With these criteria, may digital photographic development services (technology that does not use film or printing forms) with dry lab technology on photographic paper be ecolabelled.

Companies that offer school photo production, nursery photo production and similar services may have their school photo production and similar production made by digital wet lab technology Nordic Swan Ecolabelled. Photographers who carry out commissions for schools and nurseries use both ordinary printing methods and traditional wet lab technology, in part due to the greater capacity (photos per hour) that this method offers, compared with the newer inkjet techniques. Nordic Ecolabelling therefore wishes to still enable photographic development services to be ecolabelled in the context of school photo companies that use wet lab technology.

In the new version 3 of the criteria, requirements are tightened considerably in order to separate the companies offering the best digital photographic development services. Requirements are adjusted in many fields and adapted to development of technology

contributing to low energy consumption, reduced use of chemicals and use of silver-free photographic paper.

2 Basic facts about the criteria

2.1 Products that can be labelled

Product group definition has been assessed in order to clarify which products can be labelled. In version 3 of the criteria, more information about products that cannot be Nordic Swan Ecolabelled is also included.

Digital photographic development services (technology that does not use film or printing formes) with inkjet technology (dry lab technology) or equivalent technology on photographic paper may be ecolabelled. Nordic Ecolabelling wishes primarily to favour techniques with less environmental impact. Exceptions are companies that offer school photo production, nursery photo production and similar services that may have their school photo production and similar made by digital wet lab technology Nordic Swan Ecolabelled. Motive for the exception is the greater capacity (photos per hour) that the traditional wet lab technology offers, compared with the newer inkjet techniques. Other production using digital wet lab technology cannot be Nordic Swan Ecolabelled (see also requirement O23 Customer Information).

A licence can be awarded for one production site. If a company has multiple production sites, a licence will be awarded for every production site if the individual production lines that are to be included in the licence fulfil the requirements of the Ecolabel.

Other photographic development techniques used on other materials than photographic paper (such as textiles (clothing), mugs and mouse mats) cannot be ecolabelled.

Image production using digital printing techniques can be Nordic Swan Ecolabelled under the criteria for “Nordic Ecolabelling for Printing companies, printed matter, envelopes and other converted paper products”, version 5.

Companies that do not develop their own photos, but use third-party Nordic Swan Ecolabelled digital photographic development services, cannot themselves be ecolabelled, but they can promote the fact that they use Nordic Swan Ecolabelled digital photographic development services to develop photos for their customers, if such marketing makes clear reference to the Nordic Swan Ecolabel licence number and which products are ecolabelled.

2.2 About photographic development

General

Traditionally, photographic development has been an extensive process involving mixing up process chemicals, preparing the film, developing the images in processing machines and then finishing them. Images from a photographic film would be exposed on and transferred to photographic paper containing silver, with the help of a number of chemicals such as developer and fixer.

The dominant technology at the moment for all photographic development, the wet lab technique, develops the images by exposing the paper to light, for example from a laser. In response to the laser beam, the tiny silver particles (silver salt crystals) in the photo-

graphic paper release the relevant particles of colour that are bound to them. Developing chemicals are used to stop the process, so that the silver salt crystals do not end up completely black. Fixer is then added to rinse away the silver, leaving behind only the particles of colour.

About 10-15 years ago, it became clear that the technology was moving more and more towards digital photographic development. Digital photographic development has largely replaced this analogue process (which today makes up around 5% of the market). However, the industry remained convinced that the traditional, silver-based development process would remain the dominant technology into the future. We are now seeing new techniques being developed, so-called dry-lab techniques (inkjet-techniques) that do not use photographic paper containing silver.

New techniques

Technical advances have brought several different types of dry techniques (dry lab) that do not use silver or developing chemicals. Energy consumption in dry techniques is also lower compared to traditional wet lab technique. The dry techniques can roughly be divided into inkjet technology and sublimation technology.

Sublimation technology is based on dyes in a ribbon being transferred to the paper with the help of heat which causes the dyes to release, turn into a gas and absorb into the photographic paper.

The inkjet print technology also comes in different variations, but is primarily based on electricity or heat being used to force the ink from a print head onto the photographic paper.

Inkjet technology (dry lab) is not yet available for machines with high development speeds/capacity. The capacity of the most efficient wet lab machines stands at over 2000 photos per hour, while the capacity for the most common dry lab machines comes in at around 250 to 650 photos per hour. This means that certain segments/products, such as school photos, are unlikely to meet the new criteria in the future, unless there are advances in the technology that is currently in use. The school photo segment is highly seasonal, which means that the segment produces large volumes over short periods of time (particularly autumn and the season before Christmas), while during some periods of the year there is hardly any production of school photos or similar activities. Photographic shops, on the other hand, have a more even production flow spread throughout the year.

2.3 Justification for Nordic Swan Ecolabelling

Within Nordic Ecolabelling, an RPS (Relevance, Potential, Steerability) is a fundamental tool for selecting which product groups we should work with and a tool for setting the correct criteria. Are there relevant environmental problems and how large are these problems? Is there potential to have influence on the environmental issues, possibilities to reduce environmental load? Potential is estimated through possibilities to reduce environmental impact within the specific product group/services in question. Steerability indicates how activities, environmental problems or requirements can be governed by Nordic Swan Ecolabelling. Can Nordic Swan Ecolabelling do something to reduce environmental problems?

Relevance and Potential

The photographic industry has experienced great technological advances. Overall environmental impact of photographic development services has fallen due to the fact that fewer photos are developed nowadays than e.g. 10 years ago (see also the chapter The Nordic Market). The environmental effect of photographic development has also fallen due to a shift away from film development towards development techniques such as dry lab technology that requires fewer chemicals and lower energy consumption. Nevertheless, photographic development contributes to use of great quantities of chemicals and photographic paper, emissions of silver and energy consumption.

The important stages in the life cycle of photographic development comprise of

- material use (photographic paper)
- photographic chemicals
- energy consumption
- waste
- emissions to water
- working environment

In addition to photographic development, environmental burden originates also from production of photographic paper. Chemicals, energy consumption, emissions to air and water during paper production can be adjusted to minimise the environmental impact. It is estimated that relevance to adapt Nordic Swan Ecolabelled photographic development to favour low energy consumption and chemical usage and use of silver-free photographic paper is great.

Potential to set requirements for these parameters is also high due to the development of the dry lab technology. Over time, we believe that this type of photographic development technology will replace the wet lab technique that is widely used today.

As the transition to dry lab technique occurs, potential to reduce environmental load is estimated high in the following:

Silver - Traditionally, silver-based photographic paper has been used to develop photos, but newer techniques (dry lab and its equivalent) make use of silver-free paper. Although the use of silver-based photographic paper is declining, the product continues to contribute large quantities of silver to the waste cycle. Silver is toxic to aquatic organisms, and is therefore best avoided. Nordic Ecolabelling would prefer to see metals or materials, including silver, being recovered and reused rather than going to landfill. The main argument for encouraging recovery of silver is to reduce the need for mining operations and material use with short life cycle.

Energy - In photographic development, the greatest energy consumption derives from the development processes. The newer techniques (e.g. inkjet) use much less energy than the traditional wet lab technique. The lower energy consumption is due to the chemical liquids not having to be heated and kept warm during production. This type of machine is also better able to be put into standby mode. In order to promote new techniques and the best among the wet lab technique, requirements are set for electricity consumption in photographic development.

Chemicals - The transition to digital photographic development has seen a major reduction in the total quantity of chemicals used, and a change in the types of chemicals. Some of the chemicals that occur or have occurred in photographic chemicals are classified as environmentally harmful and/or extremely harmful to health. Allergic reactions have been a common working environment problem in the photographic industry. The newer techniques use ink and toner to develop photos. It remains important, however, to set requirements concerning the chemicals used, for the benefit of the environment and employee health.

In addition, to issues given above - silver, energy and chemicals - there are relevance and potential to set supplement requirements for photographic paper. Photographic paper has environment burden due to paper production. Reduced environmental impact during paper production can be achieved by using certified raw materials, by limiting the use of environmentally harmful chemicals, by producing low emissions to air and water and by reducing energy consumption. Nordic Ecolabelling has extensive experience of setting requirements for paper production, including forestry requirements.

Nordic Ecolabelling's forestry requirements have been developed in part to prevent the loss of biodiversity and the felling of rainforest. Biodiversity is also one of the most focused environmental issues that are described in Nordic Ecolabelling's "Miljøplattform¹".

Steerability

The photographic branch faces technological advances that will proceed whether Nordic Ecolabelling has the criteria for digital photographic development services. By showing to the market the difference between the techniques - the traditional wet lab technique using chemicals and paper containing silver in comparison to the dry lab technique contributing to use of fewer chemicals, silver-free photographic paper and lower energy consumption - has Nordic Ecolabelling possibility to speed up technical development. Nordic Ecolabelling wishes primarily to favour/steer the branch to techniques with less environmental impact.

Version and validity of the criteria

The first version of the criteria document for digital photographic development services was adopted by the Nordic Ecolabelling Board (NMN) in 2002. The criteria focused primarily on the development process. The criteria have since been revised once.

Version 1, adopted on 3 October 2002

In the first version, environmental requirements focused on the development process. In addition to this, there were requirements on the disposal of waste, requirements regarding the choice of chemicals and requirements concerning photographic paper, film (only film that was supplied in conjunction with ecolabelled photographic development) and packaging.

Version 2, adopted on 19 October 2007

In the second version, the requirements are tailored towards processes that are more energy efficient and require lower consumption of chemicals and water.

Version 3, adopted on 23 October 2013

The revision of version 2 was adopted by NMN in October 2013 as version 3. The focus

¹ Svanens miljøplattform, Nordic Ecolabelling, (2011).

of the revision has been on adapting the requirements to new technologies that require less consumption of chemicals and energy.

The Nordic Market

The photographic industry has seen major technological advances over the past decade, with a shift from traditional analogue film development to more efficient techniques that require fewer chemicals and less energy. In addition, fewer photos are developed nowadays. The quantity of photos developed in Sweden has gone from 6.7 million m² (in 2000) to around 2.4 million m², which has considerably reduced the economic foundations of the business².

As a consequence of this trend, the number of large-scale photo production facilities has gradually fallen across the Nordic region. Production has been shifted to other countries, primarily Germany. As of today, there are two central laboratories, one in Norway and one in Finland. In Sweden, around 50% of all photos purchased are developed abroad, which entails more transport than if the photos had been developed in the Nordic region. In Norway, Foto Knudsen is the largest photographic development laboratory. They use both old and new technologies, in addition to ordinary printers that are also used by printing companies for their business.

The industry is becoming more and more part of the graphics industry. The term central laboratory may be misleading, as it gives no indication of which technique is used. “Central laboratories” and photographic shops may use the same technology to development photos.

The traditional wet lab system is much more dominant than the newer dry lab technology. The wet lab technique offers considerably better capacity (number of photos developed per hour). Some question the quality and durability of photos developed using dry lab technology, and this view has an impact on the willingness to invest in new technology³.

Photography of school children, nursery children and sports teams is a growing market. Photographers who carry out commissions for schools and nurseries use both ordinary printing methods and traditional wet lab technology, in part due to the greater capacity (photos per hour) that this method offers, compared with the newer inkjet techniques.

In addition to their shops, the biggest players in the market also have websites where customers can order photos, photo albums, calendars and other products. Some companies only have online stores. Certain players have professional photographers and have specialised in school photos, nursery photos and events such as weddings and confirmations. Photo albums and calendars, which count as printed material, are the major products on the market. These types of products can be ecolabelled under the Nordic Ecolabelling criteria for “Printing companies, printed matter, envelopes and other converted paper products”.

The impact of the Nordic Swan Ecolabel in the market

There are a total of 23 licences for digital photographic development services in the Nordic region (August 2013). All the licences are for operations in Sweden. Six of the licences have been given to school photo companies. School photos are a growing

² Thomas Nilsson, Local Business Manager, Fujifilm Sverige AB

³ Evaluation of Nordic Ecolabelled digital photographic development services, version 2.0, 21 December 2011

segment. Rest of the licences are granted for photo shops consisting of both physical and web shops.

Other labels

Nordic Ecolabelling is unaware of any other ecolabelling systems in this field. There are numerous criteria for photocopiers, printers, toner cartridges, PCs etc. that contain partly similar requirements e.g. for ink and toners. Such systems include:

- Blaue Engel – RAL-UZ 122 (Office Equipment with printing function)
- EcoLogo (CCD-141 Digital Printing Services)
- Energy Star (Program Requirements Product Specification for Imaging Equipment)

3 About the criteria revision

Purpose of the criteria revision

The main objective of the revision is to present a proposal for revised criteria for digital photographic development services, version 3.0.

The evaluation of the criteria document for digital photographic element services, version 2, which was put before NMN in December 2011, highlighted a number of points that should be examined in the next revision of the criteria. These points were:

- Update the RPS in the background document. The aim of the RPS is to provide an overall assessment of and guidance on which areas should have requirements applied to them.
- Develop requirements for energy consumption on a par with the dry lab technology.
- Update the chemical requirements to bring them in line with dry lab systems.
- Develop requirements that take account of chemicals, energy and silver content in paper with regard to photographic development with high capacity needs, e.g. school photos. The aim is for the requirements to highlight best practice in this area.
- The quality requirements should be adapted to the photographic development industry.
- Assess the product group definition

Adjustment of the criteria to technological advances in the field has been one of the main focuses during the revision, that is requirements are adapted to dry lab technique contributing to low energy consumption, reduced use of chemicals and use of silver-free photographic paper. Over time, we believe that this type of photographic development technology will replace the wet lab technique that is widely used today.

The evaluation also considered the possibility of merging the criteria for digital photographic development services and the criteria for printing companies. It was recommended that the criteria should not be merged at the present revision, but that it should be considered in more detail next time the criteria for printing companies shall be re-examined. It was also concluded that the main challenge of such a merger would be how requirements for printing materials can be formulated as photographic paper (both silver

containing and silver-free) is not included in the Basic Module for Paper Products. The criteria for printing companies place heavy emphasis on requirements regarding paper, while the criteria for digital photographic development services, version 2, do not set any requirements regarding photographic paper, apart from the PVC requirement. The chemical requirements in the criteria for printing companies are also more extensive than the criteria for digital photographic development services. It is therefore desirable to place more emphasis on materials (photographic paper) and chemicals in the new criteria.

About this criteria review/revision

The project team comprised Anne Kristine Feltman (project manager) and Per Sandell (project adviser). Anders Moberg and Lena Axelsson were area coordinators for the project. After the external consultation has Niina Tanskanen (Nordic product manager) finalized the criteria with Per Sandell.

A proposed new criteria was sent out for consultation during the period November 2012 – January 2013 and was presented to the Nordic Ecolabelling Board (NMN) in October 2013.

4 Justification of the requirements

In the Criteria version 3, the focus of ecolabelling digital photographic development services is to promote the development of services that:

- minimise consumption of photographic chemicals and other chemicals and use products that have as little impact on the environment as possible (requirements O2-O6)
- minimise energy consumption (O7)
- minimise the environmental impact from photographic paper (O8-O9)
- minimise material consumption (O10 and requirements for waste O11-O12)
- ensure good working environment for staff (O13)

In the present version, all requirements are mandatory (i.e. point-based requirements have been removed). In this chapter, the environmental aspects of the most important requirements are described in more detailed.

4.1 The organisation (O1)

The requirement for description of the organisation is new. The requirement has been produced to gain a clear picture of the company applying for a licence. Everything from small photographic shops/retailers with their own photographic development service to large central laboratories and other such operations can develop and deliver film prints, slides and/or digital photos for private customers. The equipment/development machines, chemicals, types of paper, waste management and operational procedures vary from place to place, which makes it important to gain an overview of how each organisation works. Which machines are used for developing photos? Are the operational procedures controlled centrally? Are subcontractors used? etc.

O1 Description of the organisation

The company seeking to ecolabel its digital photographic development services must describe and report the following:

- Is the company part of a chain with its own photographic shops?
 - Does the company have multiple production locations?
 - Which photographic development techniques do the company use, and which of these are included in the application (and which photographic development machines)?
 - Does the company offer school photo services or similar?
- Duly completed description of the company/organisation, see Appendix 2.

4.2 Chemicals (O2-O6)

General requirements for chemicals

Traditionally, large quantities of chemicals have been used to develop analogue film. The most common chemicals are developers, fixers, bleaches and cleaning agents, which may be harmful to both health and the environment.

Some of the chemicals that occur or have occurred in photographic chemicals are classified as environmentally harmful and/or extremely harmful to health. Allergic reactions have been a common working environment problem in the photographic industry. Gases and fumes from photographic chemicals can create a poor working environment. Organic solvents can be problematic when heated. Emissions from chemicals in the development process may also be a potential environmental problem. Most service providers collect the chemicals and send them off destruction. The newer techniques largely avoid this problem, since chemical consumption is much less and emissions are kept to a minimum. It remains important, however, to set requirements concerning the chemicals used, for the benefit of the environment and employee health.

In the earlier version of the criteria, requirement for chemicals encompassed selection and usage of chemicals that are used in photographic development and cleaning of photographic development machines. Requirement was based on Swedish Chemicals Agency's report⁴. Some chemicals are particularly hazardous: formaldehyde, chromates, methyl glycol and its acetates, ethyl glycol and its acetates and thiourea. If production chemicals for photographic development and cleaning photographic development machines contain the above substances, they shall not be used in conjunction with the Nordic Swan Ecolabelled digital photographic development services.

In the present version of the criteria, the requirement was adjusted a little. The requirement was worded more clearly to gain an overview of the company's chemical consumption, see new requirements O2 and O3 below.

In the earlier version of the criteria, there was a requirement for chemical consumption per m² of photographic paper (point requirement). Technological advances have led to a fall in the amount of chemicals used per developed photo. The new machines are designed such that the users (photographic development companies) do not have the facility to correct chemical consumption. There is thus so little steerability that there is no point in setting such a requirement. Version 3 of the criteria for digital photographic development services will therefore not contain requirements regarding chemical consumption per m² of photographic paper.

⁴ Fotokemikalier - farligt? Tillsynsprojekt fotokemikalier. Report from Kemikalieinspektionen in Sweden nr. 1 1994. Barbro Gustavsson.

02 Overview of production chemicals for photographic production

A declaration of all production chemicals (toners, inks and other production chemicals used in the process of photographic development and cleaning agents for cleaning photographic development machines) is to be submitted, stating the product name, the name of the manufacturer, the area of application and the quantities used.

Production chemicals are mixtures or chemical substances that are used in the process of photographic development or as cleaning agents for cleaning machines.

- A list of all the production chemicals (product name, name of chemical supplier, function and quantities used e.g. litre/kg per year). Appendix 3 can be used.
- Safety data sheet/product data sheet in line with prevailing legislation in the country of application, Annex II to REACH (Regulation 1907/2006/EC) for each product.

03 Production chemicals and cleaning agents for cleaning of machines

Production chemicals used in the process of photographic development and cleaning agents for cleaning of photographic development machines must not contain following substances:

- chromates (e.g. sodium dichromate, CAS 10588-01-9, and potassium dichromate, CAS 7778-50-9)
- methyl glycol (CAS 109-86-4) and its acetates
- ethyl glycol (CAS 110-80-5) and its acetates
- thiourea (CAS 62-56-6)

Formaldehyde (CAS 50-00-0) must not exceed 0.1% by weight of the working solution.

Constituent substances encompasses all substances contained in production chemicals, including additives (such as preservatives and stabilisers) in the ingredients, but does not encompass impurities from primary production.

Residues from raw material production calculated as present in the finished product in concentrations under 100 ppm (0.010% by weight, 100 mg/kg), are regarded as contaminants. Substances that are actively added to an ingredient or product for a particular purpose are not considered to be impurities, irrespective of quantity.

- Declaration from the chemical supplier that the production chemicals used in the process of photographic development and cleaning agents used to clean the photographic development machines do not contain any of the substances above. Appendix 4 can be used.

New requirement for chemical products that are used in wet lab technique

After the consultation period, it was clarified in the criteria that production chemicals used in wet lab technology (i.e. in school photo and similar production) must at least not be classified as CMR (Carcinogenic, Mutagenic, Reproductive toxic) or hazardous to the environment. The classification requirement has been introduced to harmonise with the guidelines for Nordic Ecolabelling's environmental toxin policy⁵. Nordic Ecolabelling therefore wishes to first and foremost promote production chemicals contributing to low environmental impact.

04 Classification of production chemicals

Production chemicals used in wet lab technology must not be classified as shown in table 1 under the EU's Directive 1999/45/EC as amended and the CLP Regulation (EC) No 1272/2008 as amended.

⁵ NM Hedstein, 2007: Nordisk Miljømærkning v. Alvild Hedstein, Miljøgiftspolicy, presented for Nordic Ecolabelling Board in May 2007.

Table 1 – Classification of production chemicals

Classification	CLP Regulation 1272/2008		European Directive 1999/45/EC
Hazardous to the environment	Acute 1, Chronic 1, 2 Ozone Chronic 3, 4	H400, H410, H411 H420 H412, H413	N with R50, R50/53, R51/53, R59 R53, R52/53
Carcinogenic	Carc. 1A, 1B Carc. 2	H350* H351*	Carc.cat. 1,2 R45, R49 Carc. cat. 3 R40
Mutagenic	Muta. 1A/1B Muta. 2	H340* H341*	Muta. cat. 2 R46 Muta. cat. 3 R68
Reproductive toxic	Repr. 1A/1B Repr. 2	H360* H361*	Repr. cat. 1,2 R60, R61 Repr. cat. 3 R62, R63

**) If definitely proven that the hazard cannot be caused by other routes of exposure, the route of exposure can be stated as part of the hazard designation. Reproductive toxicity must be stated if known (effect on fertility or unborn child). One or two letters indicate the route of exposure (e.g. H350i – May cause cancer by inhalation) and/or type of effect. All additional codes are comprised by the requirement.*

- ☒ Duly completed Appendix 5 declaration from the manufacturer or supplier plus safety data sheets/product sheets in line with the prevailing European legislation.

New requirement for chemical products that are used in dry lab technique

The transition to digital photographic development has seen a major reduction in the total quantity of chemicals used, and a change in the types of chemicals. The newer techniques use ink and toner to develop photos. However, there are a number of products on the market that pose a hazard to health and the environment and that Nordic Ecolabelling thus wishes to avoid.

The criteria for digital photographic development services, version 3, include more extensive requirements regarding ink, toner and other production chemicals than the previous versions. Motive for requirements are that consumption of toner/ink accounts for the greatest consumption of chemicals during photographic development.

The criteria for “Nordic Ecolabelling for Printing Companies, Printed Matter, Envelopes and Other Converted Paper Products”, version 5, which was adopted in 2011, examined which requirements should be set for this type of product, so the requirements in this version are taken from those criteria.

In line with the criteria for printing companies, a range of requirements have been introduced concerning the classification of products and substances of very high concern that cannot be present.

The classification requirement has been introduced to harmonise with the guidelines for environmental toxin policy⁶ of Nordic Ecolabelling. Nordic Ecolabelling’s requirement regarding classification closely follows the official classification rules, in a move to exclude the worst chemicals from the photographic development process. Use of production chemicals classified as hazardous to the environment or harmful to health is forbidden. Exception to environmental hazard classification and the requirement regarding allergenic properties are toners and inks that are hardened by irradiation (e.g.

⁶ NM Hedstein, 2007: Nordisk Miljømærkning v. Alvild Hedstein, Miljøgiftspolicy, presented for Nordic Ecolabelling Board in May 2007.

UV toner and UV ink). Inks and toners that are curable by radiation are exempted since some of these are classified as environmental hazards in the uncured state. In the cured state these will not represent a hazard to the aquatic environment.

The classification applies under CLP Regulation (EC) No 1272/2008. The 'old' EU's Dangerous Substances Directive 67/548/EEC and Dangerous Preparations Directive 1999/45/EC as amended are also valid. During the transition period, up until 1 June 2015, classification under the EU's Dangerous Substances Directive or the CLP Regulation may be used. For preparations, the new regulation will apply completely in 2015.

In order to complete the requirements concerning production chemicals that are used in dry lab technique a range of substances that cannot be present in the chemical product is introduced in the criteria. The requirement is applied to substances that are actively added to the production chemical. The requirement applicable to particularly problematic constituent substances is divided into one part containing named substances or substance groups and one part concerning substances defined on the basis of certain particularly problematical properties. Examples of first mentioned are EDTA and its salts or poly- or perfluorinated substances. Late-mentioned are e.g. substances that meet the criteria for PBT (persistent, bioaccumulative and toxic substances) and vPvB substances (very persistent and very bioaccumulative) in accordance with the criteria in Annex XIII of REACH (Regulation 1907/2006/EC) or substances considered to be an endocrine disrupting or potential endocrine disrupting chemical. More detailed description regarding these substances can be found from background document of criteria for printing companies⁷.

05 Classification of production chemicals

Production chemicals (toner, ink and other production chemicals used in dry lab technology or similar) must not be classified as shown in table 2 under the EU's Directive 1999/45/EC as amended and the CLP Regulation (EC) No 1272/2008 as amended.

Table 2 – Classification of production chemicals

Classification	CLP Regulation	1272/2008	European Directive 1999/45/EC
Hazardous to the environment	Acute 1 Ozone Chronic 1, 2 Chronic 3, 4	H400 H420 H410, H411 H412, H413	With N R50, R59 With N R50/53, R51/53, R53, R52/53
Very toxic	Acute 1, 2 STOT SE 1	H330, H310, H300 H370	Tx with R26, R27, R28 Tx with R39 in combination with R26, R27, R28
Toxic	Acute 2, 3 STOT SE 1 STOT RE 1	H301, H311, H330, H331 H370* H372*	T with R23, R24, R25 T with R39 in combination with R23, R24, R25 T with R48 in combination with R23, R24, R25

⁷ About Nordic ecolabelled Printing companies, printed matter, envelopes and other converted paper products
Version 5.0 Background for ecolabelling, 15 December 2011.

Harmful to health	STOT SE 2 STOT RE 2 Asp. Tox 1	H371* H373* H304	Xn with R68 in combination with R20, R21, R22 Xn with R48 in combination with R20, R21, R22 Xn with R65
Carcinogenic	Carc. 1A, 1B Carc. 2	H350* H351*	Carc.cat. 1,2 R45, R49 Carc.cat. 3 R40
Mutagenic	Muta. 1A, 1B Muta. 2	H340* H341*	Muta. cat. 2 R46 Muta. cat. 3 R68
Reproductive toxic	Repr. 1A, 1B Repr. 2	H360* H361*	Repr. cat. 1,2 R60, R61 Repr. cat. 3 R62, R63
Allergenic	Resp.Sens. 1 Skin.Sens. 1	H334 H317	R42 R43
Other hazards	Lact. STOT RE 2	H362 H373* EUH070 EUH029 EUH031 EUH032	R64 R33 R39-41 R29 R31 R32

**) If definitely proven that the hazard cannot be caused by other routes of exposure, the route of exposure can be stated as part of the hazard designation. Reproductive toxicity must be stated if known (effect on fertility or unborn child). One or two letters indicate the route of exposure (e.g. H350i – May cause cancer by inhalation) and/or type of effect. All additional codes are comprised by the requirement.*

Toners and inks that are hardened by irradiation (e.g. UV toner and UV ink) are exempted from the requirement regarding environmental hazard classification and the requirement regarding allergenic properties (R42/H334 and R43/H317).

- ☒ Duly completed Appendix 6 declaration from the manufacturer or supplier plus safety data sheets/product sheets in line with the prevailing European legislation.

06 Substances of very high concern

Production chemicals (toner, ink and other production chemicals used in the dry lab technology or similar) must not contain the following substances:

- EDTA and its salts
- Sodium or calcium hypochlorite
- Poly- or perfluorinated substances
- Alkylphenols, alkylphenoethoxylates and derivatives thereof
- Substances categorised in REACH Article 57, XIV as Substances of Very High Concern (SVHC)
(http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp)
- Substances that meet the criteria for PBT (persistent, bioaccumulative and toxic substances) and vPvB substances (very persistent and very bioaccumulative) in accordance with the criteria in Annex XIII of REACH (Regulation 1907/2006/EC)
- Substances that are carcinogenic, mutagenic and toxic to reproduction (categories 1 and 2/1A and 1B in CLP)
- Substances considered to be an endocrine disrupting or potential endocrine disrupting chemical (EDC), category I or II, in accordance with the European Union's reports concerning endocrine disruptors
(http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf)

- The heavy metals lead, tin, cadmium, chromium VI, mercury and their compounds must not exceed a total of 100 ppm (milligrams per kilo) in toner and ink.
 - The content of unsulphonated primary aromatic amines soluble in 1M hydrochloric acid and expressed as aniline must not exceed 500 mg/kg and there must be no more than 10 mg/kg benzidine, β -naphthylamine and 4-aminobiphenyl in total in toner and ink.
- Duly completed declaration from the raw material manufacturer or supplier, see Appendix 6.

4.3 Energy (O7)

In photographic development, the greatest energy consumption derives from the development processes. There are no standardised tests for measuring energy consumption in relation to m^2 of photographic paper, and there is little available data for assessing energy consumption.

Traditional minilabs consume almost 10 000 kWh per year⁸. Experience tells us that minilabs (wet lab) use 80-230 Wh/ m^2 of developed photographic paper, while the newer techniques (e.g. inkjet) have lower energy consumption. The lower energy consumption is due to the chemical liquids not having to be heated and kept warm during production. This type of machine is also better able to be put into standby mode.

In order to promote the new techniques and the best in wet lab technology, had Nordic Ecolabelling chosen in the proposal version to make the requirement regarding electricity consumption in photographic development more demanding, from potential requirement $< 500 \text{ Wh}/m^2$ to absolute requirement at max $100 \text{ Wh}/m^2$. The requirement was no longer points-based, but a compulsory requirement that everyone must fulfil, whichever technique they use.

After the consulting period of the criteria, the requirement for energy consumption was adjusted from $100 \text{ Wh}/m^2$ to $120 \text{ Wh}/m^2$. The adjustment was done in order to take better into account all the relevant apparatus that is required in the production process.

The measurement of energy consumption is dependent on many factors, including the room temperature where the measurement is conducted, the length of the measurement period, how many photos are developed and so on. For this reason the applicant shall report on how measurement of electricity consumption is done (see more closely documentation for requirement O7).

When measuring energy consumption, all the relevant apparatus is to be included in the measurement, since energy consumption is measured for the whole photo production process, not just the actual unit that produces the physical photo. The energy consumption measurement also covers other equipment that is required in order for the production process to function successfully.

The measurement thus relates to all the apparatus that has to be in operation to make the photo production possible. In addition to the unit that produces the physical photo, this may include a computer and monitor used to control the production system, for example.

⁸ Lars Ericsson, Product Specialist Photofinishing, Fujifilm Sverige AB

If a company applies for a licence for several units that produce photos, and the units are connected to the same computer and monitor, the energy consumption of the computer and monitor should only be counted once.

Computers or other machines/equipment that are necessary in order to produce photos, and that are also used for other purposes, are to be included when calculating energy consumption.

07 Electricity consumption in photographic development

The standardised electricity consumption for photographic development, expressed in Watt-hours (Wh) per square metre (m²) of paper, must not exceed 120 Wh/m² for each photographic development machine including all relevant equipment.

- Report on measurement of electricity consumption (see Appendix 7) covering the following parameters:
- How long (number of minutes or hours) electricity consumption was measured for. Must be at least 30 minutes during photographic development.
 - Electricity consumption during the given measurement period
 - Number of photos developed during the measurement period
 - Size of the photos in cm
 - Results of the measurement in Watt-hours (Wh) per square metre (m²) of photos

4.4 Photographic paper (08-09)

General

Traditionally, silver-based photographic paper has been used to develop photos, but newer techniques (dry lab and its equivalent) make use of silver-free paper. Although the use of silver-based photographic paper is declining, large quantities of silver still end up to the waste cycle.

Photographic paper differs from ordinary printing paper in that it comprises several layers of different materials. The top layer is made of a water-permeable plastic, followed by a layer of light-sensitive photo emulsion (paper), and finally a non-permeable plastic coating. The plastic layers are believed to be a form of polyester or PVC. One example of the composition of photographic paper for wet lab (silver-based paper) is⁹:

- 65-75% paper
- 20-30% polyethylene
- 1-5% photographic gelatine
- < 1% silver halides and additives

The light-sensitive photo emulsion comprises suspended micro crystals of silver particles (primarily silver bromide), with the silver particles accounting for around 42% of the emulsion. The materials used to develop colour photographs are either covered with two polyethylene layers on each side of the paper, or are pure polyethylene. The silver content of photographic paper varies depending on the quality of the paper. Generally, photographic paper of higher quality has a higher silver content than lower grades.

An example of the composition of a photographic paper for dry-lab (silver-free paper) is:

⁹ Article Information Sheet 09/04/2012 Kodak Resin-coated colour papers

- 50-70 % paper
- 10-30 % polyethylene
- 5-15 % inorganic pigments
- 1-7 % polyvinyl alcohol
- 1-7 % other substances

In addition to generating silver waste, the photographic paper also impacts on the environment through its paper element and the production of that paper. In the earlier version of the criteria, there was no other requirement for paper, apart from prohibition to use PVC in paper. In the present criteria, new requirements are introduced, namely requirement for silver and requirements for paper and pulp that are used in production of photographic paper.

Requirement for silver and PVC in photographic paper

When it comes to Nordic Swan Ecolabelled digital photographic development services, it is desirable for the photographic paper not to contain either PVC (polyvinyl chloride) or silver.

The requirement to avoid PVC in photographic paper derives from Nordic Ecolabelling's goal of minimising the issues arising from problematic waste. The key problem areas for PVC are waste management, use of additives and dioxin emissions, particularly in the production of PVC. In its preliminary study of photographic services, the project team concluded that some photographic papers might contain PVC, and a requirement was therefore introduced stating that photographic paper must not contain PVC.

Silver is toxic to aquatic organisms, and is therefore best avoided. Nordic Ecolabelling would prefer to see metals or materials, including silver, being recovered and reused rather than going to landfill. The main argument for encouraging recovery of silver is to reduce the need for mining operations and material use with short life cycle.

The new dry techniques do not use silver-based paper, while wet lab techniques continue to favour photographic paper that contains silver. Requirement for silver-free photographic paper is applied to new techniques while paper containing silver is only applicable to companies offering school photo production. Dry lab technique is relatively new and its capacity to produce photos per hour is not as great as by using wet lab technique. Because of lower capacity, in addition to high investment cost, many photographers - especially those who carry out commissions for schools and nurseries - still use traditional wet lab technology. Therefore, exception for photographic paper containing silver is applied to photographic development services in the context of school photo companies that use wet lab technology.

During the revision of version 3, the project team considered adding a requirement regarding how much silver the photographic paper may contain. However, the conclusion was that such a requirement would do very little to reduce the environmental impact, because:

- There is a close link between photo quality and silver content in the paper, with higher silver levels bringing higher photo quality.

- The possibility of influencing the producers of the photographic paper was judged to be small, since the few manufacturers responsible for its production operate in a global market.
- The silver is released from the photographic paper during the development process and is rinsed away and collected with other chemicals.
- Requirement O14 in version 3 states that waste containing silver (paper and chemicals) must be sent for recovery and not to landfill.
- Silver-containing paper is only used in wet lab processes, not dry lab processes, which means that the amount of silver used in photo production is generally falling with the adoption of new technology.

Requirement for pulp used in photographic paper

In addition to generating silver waste, the photographic paper also impacts on the environment through its paper element and the production of that paper. The reason for the absence of any previous requirement regarding the photographic paper is primarily the historical difficulty in sourcing information about the paper and its manufacture. Once again, while working on version 3 of the criteria, it has been difficult to find enough relevant information about the paper and its production. Despite the lack of information, Nordic Ecolabelling has deemed it appropriate to set certain fundamental requirements concerning the photographic paper over and above the requirement regarding PVC and silver (in O8).

In the proposal version, there were requirements for certified traceability and control of fibre raw material in photographic paper (R8), Bleaching using chlorine gas (R9) and Chemicals used for coatings (R10). These requirements were taken from Nordic Ecolabelling's Basic Module for Paper Products¹⁰, and constitute a minimum level that is relevant when introducing environmental requirements for paper.

After the consulting period, requirements regarding photographic paper were revised. Requirements concerning fibre raw material and bleaching using chlorine gas were removed and the requirement for photographic paper was adjusted. 'At least 50% of the pulps that are used in the production of photographic paper must be inspected by Nordic Ecolabelling' was introduced into the criteria. Adjustments were done to harmonise the requirements of photographic paper with those set for the paper in the criteria for printing companies. Harmonization of the paper requirements was needed in order to merge the criteria for digital photographic development services and printing companies in the near future. Basic requirements regarding pulp production are first stage in the process of unifying the criteria.

The requirements were taken from Nordic Ecolabelling's Basic Module for Paper Products and consist first and foremost of informative requirements. In addition to requirements concerning fibre raw material and bleaching using chlorine gas, pulp producer shall describe energy consumption, emissions to water and air and chemicals used in pulp production. More detailed description regarding environmental aspects can be found from background document of the Basic and Chemical Module for Paper Products¹¹.

¹⁰ Nordic Ecolabelling of Paper Products - Basic Module, version 2.1

¹¹ Background document for Nordic Ecolabelling of Paper Products - Basic Module and Chemical Module version 2

During year 2012, Nordic Ecolabelling has introduced a new electronic application tool 'My Swan Account' to pulp and paper producers. To document the requirements of pulps that are used in production of photographic paper the pulp producer/supplier is recommended to use My Swan Account.

Requirement for coatings used in photographic paper

In addition to pulp used in paper, paper consists of other non-fibres like starch, pigments, fillers and coatings. Coatings are usually clay, chalk and binders. In the requirements for ecolabelled photo development, all coatings used must be documented. This is regarded as a minimum level that is relevant when introducing environmental requirements for the photographic paper. If the criteria for photographic development services and printing companies will be merged in the future, supplement requirements concerning paper will be focused extensively in the next revision.

08 Photographic paper

Photographic paper used for the ecolabelled photographic development must not contain silver (Ag) or be made from or contain chlorine-based plastic (PVC).

Exception to the requirement: photographic paper used in a wet lab context for the production of school photos may contain silver.

At least 50% of the pulps that are used in the production of photographic paper must be inspected by Nordic Ecolabelling,

All types of photographic paper to be used in Ecolabelled photographic development must be documented with product name, manufacturer/supplier and composition.

- Enclosed documentation showing product name, manufacturer/supplier and composition of the photographic paper.
- Duly completed declaration from manufacturer/supplier of the photographic paper used for photographic development stating that the paper does not contain silver (Ag) or is made from or contain chlorine-based plastic (PVC).
- Duly completed declaration from manufacturer/supplier of the photographic paper used in a wet lab context stating that the paper is not made from or contain chlorine-based plastic (PVC).
- The pulp producer shall use the electronic application tool My Swan Account (MSA) to get his pulps inspected by Nordic Ecolabelling.

09 Production chemicals used for coatings

All production chemicals used for coating must be described with full name, safety data sheet, function, classification and the amount that is used in production in kg/tonne for the finished photographic paper.

Production chemicals for coating cover the chemicals applied to the base paper following the pressing stage in a papermaking machine.

- Description of production chemicals used for coating. Appendix 8 can be used.
- Safety data sheet/product data sheet in line with prevailing legislation in the country of application, Annex II to REACH (Regulation 1907/2006/EC) for each product.

4.5 School photo production (O10)

For companies that offer school photos, it has been common practice for all the photos taken of the customer to be developed and sent to the customer for their consideration,

before an order is placed. According to information from the industry, as much as 28%¹² of the photos that are developed and sent home for consideration are then sent back to the school photo company. The return of the photos that the customer does not want means that a quarter of the production is discarded.

Although it is becoming more common for customers to be able to browse through the photos electronically before placing an order, there are companies that do not wish to give customers electronic access to the photos until the customer has agreed for the photos to be sent home for consideration. Some companies offer their customers only the choice of ordering complete photography packages, which can be up to 3-5 A4 sheets. From an environmental perspective, these systems lead to unnecessary development of photos that customers do not want, and are seen as a waste of resources. In the proposal version, Nordic Ecolabelling wished to help to reduce material consumption by encouraging consumers and school photo companies to request and offer browsing of the photos electronically, without the photos being developed in advance. Nordic Ecolabelling also wished customers to be able to order parts of photography packages, not just a complete package.

After the consulting period, some adjustments were done to the requirement. The proposal version directed customers to order the photos via internet. After the consulting period, the requirement was adjusted in order to give more flexibility to applicant: ordering in internet is not the only possibility. The applicant shall document detailed description/report of the ordering procedures for customers, including online ordering, ordering form or similar information revealing how photos are ordered. The share of orders that shall be done without the photos being sent to home for reviewing was also adjusted. At least 70% of the orders shall be done without sending them home for consideration before an order is done. In the earlier version of the criteria, this specific requirement was point-based requirement.

In the proposal version, there was requirement R11 stating that use of wet-lab technique is allowed only if over 85% of companies business is based on school photo production or similar services. Background for the proposal was a concern about that customers may misunderstand which production is Nordic Swan Ecolabelled if only a small part of the production that company offers is actually Nordic Swan Ecolabelled. Nordic Ecolabelling clarified the requirement O23 in order to minimise misunderstanding and now it should be possible for companies offering only a little share of school photo to ecolabel their production. Due to removal of R11, the requirement O23 was adjusted.

O10 Ordering of photos

This requirement applies only to businesses engaged in school photo production or similar services.

At least 70% of the orders, measured in number of delivery addresses, monetary sales or m² of photos, must be made without the photos being sent to the customer for reviewing.

When a photo package consists of several pictures/sheets the customer must have the option of ordering a maximum of one sheet.

- Detailed description/report of the ordering procedures for customers, including online ordering, ordering form or similar information revealing how photos are ordered.

¹² Thomas Nilsson, FujiFilm Sverige, 2012

- Procedures enabling the company to constantly monitor that it does not offer less than 70% electronic ordering that shall be done without the photos being sent to home for reviewing.

4.6 Waste (O11-12)

Material efficiency and waste are one of the most prioritized fields in Nordic Ecolabelling's Environmental platform¹³. Nordic Ecolabelling's requirement regarding waste seeks to minimise amounts of waste. The waste that arises must be sorted to facilitate reuse and recycling. The background to the move towards sorting into several fractions is motivated by the EU's Waste Framework Directive (2008/98/EC).

Like all production, photographic development generates waste. According to requirement O11, hazardous waste and electronic waste shall be collected and sent for controlled disposal. Recovery and reuse of electronic components and materials helps to conserve natural resources and reduce the amount of waste sent to landfill. Discarded electronic equipment causes a major waste problem due to constituent substances that are harmful to health and the environment, such as flame retardants and lead. Due to these reasons, hazardous waste and electronic waste is to be collected and sent for controlled disposal. The requirement was adjusted a little as compared with the earlier version. The requirement for other sorting was deleted since the quantities were judged to be extremely small.

Nordic Ecolabelling would prefer to see metals or materials, including silver, being recovered and reused rather than going to landfill. The main argument for encouraging recovery of silver is to reduce the need for mining operations. Compared with the earlier version of the criteria, the requirement regarding silver waste (including unexposed silver-containing photographic paper) and chemicals from shops remains unchanged. The chemicals used in wet lab technique are harmful both to health and the environment, and therefore must be collected and destroyed. Wrongly developed photos and unexposed photographic paper that contains silver must be sorted out and sent for controlled disposal. The requirement now also includes water with silver content that is released into the drains, something that is not permitted. After development, the silver is transferred to the rinsing water, ensuring that the finished product does not contain silver. It is therefore important that all waste chemicals, including rinsing water, are dealt with by a waste management company. This requirement applies to all production lines in the production site, also those not covered by the licence.

O11 Waste

Hazardous waste and electronic waste is to be collected and sent for controlled disposal.

- Describe the procedures for handling hazardous waste and electronic waste. Include a contract showing who handles the sorted waste or alternatively an invoice showing who handles the sorted waste.

O12 Waste products with silver content and wash water

All waste chemicals (including wash water) deriving from the development processes* must be collected and sent for controlled disposal. All photographic paper that contains silver must be sorted out and sent for controlled disposal.

Fractions containing silver are to be sent for silver recovery.

¹³ Environmental platform, Nordic Ecolabelling. (2011).

** Requirement is applied to all waste chemicals deriving from all production lines in the production site, also those that are not covered by the licence.*

- Description of how waste chemicals and waste that contains silver are dealt with, plus a contract or invoice showing which company handles the waste fractions.

4.7 Working environment (O13)

In traditional minilabs, it has been common to manually mix the photographic chemicals in 10 or 100 litre tanks before the mixture is pumped across to the machines. Mixing the chemicals and removing the residues by hand can cause exposure for employees. The newer techniques use cassette systems for dosing. Nordic Ecolabelling would thus like to ensure that Nordic Swan Ecolabelled digital photographic development services handle chemical dosing in enclosed systems. In the present version, the requirement O13 which was formerly a points-based requirement at various levels, is now changed to a compulsory requirement. All chemicals used for photographic production must be added in closed systems.

O13 Working conditions

All chemicals used for photographic production must be added in closed systems.

- Declaration of how the requirement is fulfilled.

4.8 Environmental management and regulatory requirements (O14-O26)

Nordic Ecolabelling normally sets a number of general requirements in its criteria for products and services. The criteria for Digital photographic development services can be regarded to be criteria for both a product and a service. Therefore, the chapter on environmental management has been adapted to take this into account. This means, for example, that there has been made some deviations from the normal template for environmental management but also that this chapter is adapted to the branch's external conditions.

In comparison to previous version, requirements concerning Quality (O15), Traceability (O19) and Technical servicing (O22) were clarified. Some of the requirements are new (e.g. O18 and O21) or partly new. e.g. requirement for Customer information (O23). This specific requirement was previously part of the product group definition as a means to show clearly what was Nordic Swan Ecolabelled. Now it is part of the customer information requirement to clearly inform the customer about which part of the service is Nordic Swan Ecolabelled. The requirement for recording journals and annual reports was deleted since it is covered through other requirements.

A requirement that the company must have an environmental policy is new (O14). The company must draw up an environmental policy that sets out the company's level of ambition and the goals for the environmental efforts.

Nordic Ecolabelling previously had a requirement that the quality of the development process should be checked using control strips. Nordic Ecolabelling has no experience suggesting that control strips are a true indicator of good quality. Experience from the industry is that errors in picture quality are corrected on an ongoing basis during production, and that this is a better way to quality assure the photos. Because of this, was

requirement that the company must have procedures for maintaining high quality in its photo production and for handling complaints/claims from customers clarified (O15).

Requirement for Take-back system (O16) ensures that licensee shall collect packaging. Different regulations for recycling are applied in different Nordic countries. Relevant national regulations within the sector regarding the recycling systems for products and packaging shall be met in the Nordic countries in which the Nordic Swan Ecolabelled digital photographic development services are marketed. The Nordic Ecolabelling's Criteria Group decided on the 9 October 2017 to remove this requirement. Requirements for return systems have now been incorporated in the Nordic countries, which means that the Nordic Ecolabelling requirement for membership in a return company will be out of date and therefore no longer need to be managed by Nordic Ecolabelling in a separate requirement.

It is necessary for Nordic Ecolabelling to know, at all times, who the licensee's contact person is for the Nordic Swan Ecolabel. The applicant shall therefore appoint an individual responsible for ensuring the fulfilment of the Nordic Ecolabelling requirements, and a contact person for communications with Nordic Ecolabelling. Several other areas of responsibility are also introduced in requirement Organisation and responsibility (O17). It must be made clear who is responsible for internal communication and education and purchasing (chemicals, including inks, waste management services, photographic paper and photographic development equipment). Meanwhile, requirements for Training (O20) and Purchasing (O21) are also introduced. These requirements are included to ensure that everyone in the company who has duties that affect compliance with the Nordic Ecolabelling requirements receives the right information.

Changes to the ecolabelled production process may have repercussions for the Nordic Swan Ecolabel licence. A written report of all changes that may relate to the requirements set for the ecolabelled service must therefore be submitted to Nordic Ecolabelling (O18). This will enable Nordic Ecolabelling to provide information on what needs to be done to ensure that the change does not impact on the licence. In the event of unforeseen non-conformities, Nordic Ecolabelling may assess the consequences of the non-conformity and provide advice on what action the licensee should take.

After the consulting period, Nordic Ecolabelling clarified the requirement Customer information (O23) to ensure that customers do not misunderstand what production is Nordic Swan Ecolabelled. Nordic Ecolabelling will also ensure that production using wet lab technique and not in the field of school photo or equivalent is not marketed as Nordic Swan Ecolabelled.

The requirement O23 was also adjusted due to removal of requirement K11. In the proposal version, there was requirement K11 stating that use of wet-lab technique is allowed only if over 85% of companies business originates from school photo production or similar services. Background for the proposal was a concern about that customers may misunderstand which production is Nordic Swan Ecolabelled if only a small part of production that company offers is actually Nordic Swan Ecolabelled. Nordic Ecolabelling has clarified requirement O23 in order to minimise misunderstanding and now it should be possible for companies offering only a little share of school photo to ecolabel their production.

014 Environmental policy

The company must draw up an environmental policy that sets out the company's level of ambition and the goals for the environmental efforts. The environmental policy must be signed by the CEO/senior executive.

- Description of environmental policy, signed by the CEO/senior executive.

015 Quality

The company must have procedures for maintaining high quality in its photo production and for handling complaints/claims from customers.

- Procedures showing how the high quality of the photo production is maintained and procedures for handling complaints.

016 Take-back system

The Nordic Ecolabelling's Criteria Group decided on the 9 October 2017 to remove this requirement.

017 Organisation and responsibility

The company's organisation must be described, and it must be made clear who is responsible for the following:

- The Nordic Swan Ecolabel licence (who is responsible for ensuring the fulfilment of Nordic Ecolabelling requirements)
- Marketing (who is responsible for ensuring that the marketing of the Nordic Swan Ecolabel complies with the "Regulations for the Nordic Ecolabelling of Products")
- Internal communication and education (who is responsible for ensuring that everyone in the company who has duties that affect compliance with the Nordic Ecolabelling requirements receives the right information)
- Purchasing (who is responsible for purchasing the following: chemicals, including inks, waste management services, photographic paper and photographic development equipment)
- Contact person for communications with Nordic Ecolabelling (who will Nordic Ecolabelling have primary contact with)

- Declaration that the requirement is fulfilled. Appendix 2 can be used.

018 Changes and nonconformities

Nordic Ecolabelling must be informed of/approve planned changes in products and markets that have a bearing on Nordic Ecolabelling requirements. Unplanned nonconformities that have a bearing on Nordic Ecolabelling requirements must be reported to Nordic Ecolabelling.

Planned changes include a change of focus for the business, purchasing/changing development machines or changing production chemicals.

Non-conformities that must be reported include major chemical leaks, personal injuries or large-scale customer complaints.

- Procedure detailing how planned changes to the business are dealt with. The procedure must state who will contact Nordic Ecolabelling and when.

- Procedures detailing who will contact Nordic Ecolabelling and when in the event of non-conformities that affect the Nordic Swan Ecolabel licence.

019 Traceability

The licence holders must have traceability on the Ecolabelled photo production.

- Description and procedure how to ensure the requirement is fulfilled.

020 Training

All employees and contractors that are part of daily operations must have the know-how to ensure fulfilment of Nordic Ecolabelling requirements.

- Procedure detailing how the company ensures that employees have the necessary knowledge to maintain compliance with the Nordic Ecolabelling requirements.

021 Purchasing

The company must have procedures in place regarding purchasing of products and services that affect compliance with the Nordic Swan Ecolabel licence in minimum the areas of chemicals, including inks, photographic paper, waste management services and photographic development equipment.

- Procedures clearly detailing that the purchases comply with the requirements of the Nordic Swan Ecolabel licence.

022 Technical servicing

There must be procedures in place for servicing and maintenance of the photographic development equipment. The internal procedures must include a description of how servicing is carried out, or a contract with an external company that carries out the servicing. Servicing must be carried out at least once a year. An environmental management system or service contract must show how checks are carried out.

- Procedures for servicing or copy of contract with external company that carries out the servicing.

023 Customer information

Customers must be informed that they have dealt with a Nordic Swan Ecolabelled company and what that entails.

If the company sells or market other products where photos are printed or applied on a material, the information for the customers must be clear in that only the photographic production is Ecolabelled.

If the company has photographic development equipment that is not covered by the Nordic Swan Ecolabel licence, the information must be clear enough that there can be no misunderstanding about which production system carries the Nordic Swan Ecolabel.

Companies that offer school photo production with photographic paper containing silver, can only market their school photo, nursery photo production and similar services as Nordic Swan Ecolabelled. Other production on the production lines with silver paper cannot be marketed Nordic Swan Ecolabelled.

- Copy of customer information.

024 Application documentation

A copy of the application including safety data sheets, calculation data and other supporting documentation for the Nordic Swan Ecolabel application must be readily accessible.

- Description of how the documentation will be archived.

025 Legislation

The company must guarantee that the relevant applicable legislation is adhered to at all the production sites where the Nordic Swan Ecolabelled service is provided. This includes safety regulations, working environment legislation, environmental legislation and conditions/concessions specific to the sites.

Failure to comply with this requirement may result in Nordic Ecolabelling revoking the licence.

Signed and submitted application form.

O26 Marketing

The requirement is removed as decided by the Board of Directors 17 November 2014.

4.9 Changes in the generation 3

Nordic Ecolabelling adopted version 3 of the Criteria for Nordic Ecolabelled Digital Photographic Development Service on 23 October 2013. The Criteria are valid until 31 December 2017.

On 17 November 2014 the Board of Directors decided to remove requirement O26 Marketing. On 21 December 2016 the Nordic Ecolabelling's Criteria Group decided per capsulam that the validity of the Criteria document is prolonged for 18 months. The new version is called 3.1 and is valid until 30 June 2019.

On the 9 October 2017 Nordic Ecolabelling's Criteria Group decided to remove O16 Take-back system. Nordic Ecolabelling's Criteria Group decided on 19 June 2018 to prolong the criteria to 31 March 2021. The new version is called 3.2.

The Criteria for Digital Photographic Development Services follow the Criteria for Printing Companies, Printed matter, Envelopes and other Converted Paper Products, version 5 because the processes approach steadily printing processes with respect to chemicals, machines etc. It is therefore relevant to assess whether the Criteria for Digital Photographic Development will be merged in the Criteria for the Printing Companies next time the criteria is revised. The revision of the Criteria for Printing Companies is expected to start up soon. The current version of the criteria is prolonged. Thus it became relevant also to prolong the Criteria for Digital Photographic Development Services.

5 Changes compared to previous version

Comparison of requirements for digital photographic development services in criteria version 2 and version 3. In criteria version 2, many of the requirements were point-based requirements whereas in the version 3, all requirements are mandatory.

Version 3	V 2	Same	Changed	Deleted	New req.	Draft for consultation
Product definition			x			The product group definition has been rewritten for greater clarity. It also contains more information about what cannot be ecolabelled.
O1 Description of the organisation	-				x	The requirement has been produced to gain a clear picture of the company applying for a licence.
O2 Overview of production chemicals for photographic production	O1		x			The requirement has been worded more clearly to gain an overview of the company's chemical consumption.
O3 Production chemicals and cleaning agents for	O1	x				

cleaning of machines						
O4 Classification of production chemicals					x	The classification requirement has been introduced to harmonise with the criteria for printing companies and reflects the content of the CLP Regulation.
O5 Classification of production chemicals					x	The classification requirement has been introduced to harmonise with the criteria for printing companies and reflects the content of the CLP Regulation.
O6 Substances of very high concern					x	The classification requirement has been introduced to harmonise with the criteria for printing companies and reflects the content of the CLP Regulation.
O7 Electricity consumption in photographic development	P2		x			The requirement has been changed from a points-based requirement to a compulsory requirement. The requirement regarding electricity consumption has also been tightened, moving from possible electricity consumption > 500 Wh/m ² to an absolute maximum of 120 Wh/m ² .
O8 Photographic paper	O2		x		x	The PVC requirement now only relates to the photographic paper, not the film and packaging as in version 2. The requirement regarding silver-free photographic paper has been introduced for new technologies, and the use of silver-containing photographic paper has been restricted to companies that provide school photo services.
O9 Production chemicals used for coatings					x	Documentation of production chemicals used for coatings
O10 Ordering of photos	P6		x			Due to recent technical advances, electronic ordering is now a compulsory requirement, and the requirement has also been made more demanding. Photos relating to school photography must not be produced simply for previewing before ordering.
O11 Waste	O3		x			Clear requirement regarding sorting of hazardous and electronic waste. The requirement for other sorting has been deleted since the quantities were judged to be extremely small.
O12 Waste products with silver content and wash water	O4		x		x	The requirement regarding waste with silver content (including unexposed silver-containing photographic paper) and chemicals from shops remains unchanged. The requirement now also includes water with silver content that is released into the drains, something that is not permitted.
O13 Working conditions	P3		x			Formerly a points-based requirement at various levels, it has now been changed to a compulsory

						requirement.
O14 Environmental policy					x	A new requirement that the company must have an environmental policy.
O15 Quality	M1				x	This requirement and the documentation requirement have been reworded and simplified.
O16 Take-back system	M3	x				
O17 Organisation and responsibility	M5				x	More areas of responsibility have been added to the requirement.
O18 Changes and responsibility					x	A new requirement that the company must have procedures to deal with changes and non-conformities. It also emphasises the fact that fulfilment of the requirements must be maintained over time.
O19 Traceability						
O20 Training	M6/ M7				x	The training requirement has been adjusted to take account of the fact that photographic development machines are largely automated, creating less of a need for training.
O21 Purchasing					x	A requirement concerning purchasing procedures has been introduced to ensure that the company lives up to the requirements at all times.
O22 Technical servicing	M6		x			The requirement that there must be a servicing agreement for the machine has been deleted. Instead, a requirement regarding maintenance procedures has been introduced, although this may still be fulfilled through a servicing agreement.
O23 Customer information			x			The requirement is partially new. It was previously part of the product group definition as a means to show clearly what was Nordic Swan Ecolabelled. Now it is part of the customer information requirement to clearly inform the customer about which part of the service is Nordic Swan Ecolabelled.
O24 Application documentation	M9	x				
O25 Legislation	M10	x				New documentation requirement
O26 Marketing	M8	x				The requirement has been updated in line with Nordic Ecolabelling's general marketing requirements.
Silver discharges, central laboratories	O5 \ P4				x	The limit value has been deleted due to the introduction of requirement R12 regarding how waste products with silver content and wash water must be dealt with and sent for controlled disposal.
Chemical and water consumption, print development	P1				x	The requirement has been deleted since technological advances mean that steerability of chemical consumption is extremely low once the photographic development

						machine has been purchased.
Use of Nordic Swan Ecolabelled printed matter	P5			x		The requirement has been judged to be of little relevance, and has therefore been deleted.
Recording journals and annual reports	M4			x		The requirement has been deleted since it is covered through other requirements.
Requirement regarding written work instructions and information on chemicals	M7			x		Chemical consumption has reduced considerably and chemicals are handled in closed systems. The requirement is therefore less relevant and has been deleted.

6 New criteria

A future revision should examine the possibility of incorporating the criteria for digital photographic developments services into the criteria for Nordic Ecolabelling for printing companies, version 6. Points which must then be considered in regard of photographic development are:

- adapted requirements for photographic paper
- energy requirements
- requirements for photographic paper containing silver

Especially, consistent chemical requirements shall also be considered.

7 References

References, contacts and other sources used during revision work are cited on the relevant page of the background document (as footnote).

Terms and definitions

Term	Explanation or definition
Analogue photos	Photos that are exposed on film using a traditional camera.
CLP	Classification, Labelling and Packaging of Substances and Mixtures. A harmonised system applied within the EEA. The system is based on GHS (Globally Harmonised System of Classification and Labelling of Chemicals), which was developed by the UN.
CMR	Carcinogenic, Mutagenic or toxic to Reproduction
Coating chemicals	Production chemicals for coating cover the chemicals applied to the base paper following the pressing stage in a papermaking machine.
Digital photos	Photos from a digital medium: digital camera, memory card, CD, photos via e-mail, internet, etc.
Dry lab	Definition to photographic developments techniques that are used without liquid developing chemicals. Dry lab refers mostly to inkjet technology but also sublimation technology is included.
INK	All chemicals, apart from toners, used to transfer an image to the material by digital photographic development.
Inkjet technology	Dry lab technique in which ink from a print head is forced onto the photographic paper, similar technology to inkjet printers.
PBT	Persistent, Bioaccumulative and Toxic
Photographic paper	The material that carries the finished photos. The photographic paper used for the wet lab technique contains silver, while the dry lab technique uses silver-free paper. Photographic paper is made up of several layers of paper and plastic.
Production chemicals	Chemical preparations/solutions or chemical substances that are used in process of photographic development and for cleaning photographic development machines.
R-phases	Description of R phrases under the EU's classification systems, as defined in Directives 1999/45/EEC and 67/548/EEC.

School photos	The term "school photos" relates to the photographic service some companies offer schools, nurseries, sports teams and so on. The company takes pictures of the children (portraits and group photos) and offers the customers the resulting photos.
SVHC	Substances of Very High Concern are defined in Article 57 of Regulation (EC) No 190/2006 ("the REACH Regulation") and include substances which are CMR, PBT or vPvB and/or identified from scientific evidence as causing probable serious effects on human health or the environment of an equivalent level of concern as those above.
Toner	All chemicals, apart from inks, used to transfer an image to the material by digital photographic development. Toners come in both dry (powder) and wet (liquid) form. Fuser fluid and developer used together with dry toner also count as chemicals in the toner category. Image oil and other chemicals used with wet toner also count as chemicals in the toner category.
VPvB	very Persistent and very Bioaccumulative
Waste in the form of photographic paper and film that contains silver.	All silver-containing photographic paper and film, and remains of these that contain silver and that the service provider will not be using in the production or personally dealing with in terms of recovering silver or similar.
Wet lab	Wet lab is the traditional photographic technique in which images are transferred to photographic paper containing silver with the help of a number of chemicals such as developers and fixers.