Nordic Ecolabelling for

Printing Companies and Printed Matter

Version **6.0** • date – date

Consultation proposal

Nordic Ecolabelling

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This document is a translation of an original in Danish. 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:

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1 Summary

The development in the graphical industry is changing towards new digital printing technologies which allows printing on all types of substrates/materials. The industry produces everything from printed matter and packaging to "Wrapping" of cars and buildings.

In order to assess the different printing technologies and types of printing substrates, the functional unit has changed from "one tonnes finished product" to "one tonne purchased/used substrate".

New requirements for substrates other than paper

The 6th generation of criteria for Nordic Ecolabelling Printing Companies and Printed Matter includes newly developed requirements concerning substrates other than paper. As for paper, substrates other than paper needs to be inspected in order to be available for the printing company in the electronic application aid. The requirements comply:

- Substrates, including release paper/liner, must not contain halogenated organic compounds in general. For example: PVC, PVC coating, organic chloroparaffins, flourine compounds and flame-retardants;
- All **chemical products used in the finishing of the substrate** must not be classified as hazardous to the aquatic environment, toxic, respiratory or skin sensitisation or CMR;
- At least 50% of fabrics/textiles must be Nordic Swan- or EU Ecolabelled, EOKO-TEX 100 (class IV) or GOTS certified;
- At least 50% of the wood-based panels/boards must be FSC- or PEFC certified or Nordic Swan Ecolabelled.

Stringent requirement for inspected and Ecolabelled paper

The requirement for inspected and Nordic Swan/EU Ecolabelled paper has been stringent from at least 25% to 70%.

Updated chemical requirements

The requirement for classification of production chemicals has been updated in relation to CLP and the Nordic Ecolabelling´s general chemical requirements. This means that several exemptions and trivial limits for specific chemical has been removed in generation 6 e.g.:

- Toluene-based washing agents and printing ink and chemicals containing chrome trioxide and copper sulphate used in gravure printing. This means that it is not possible to use rotogravure printing in the new generation 6;
- UV inks (energy-curable inks) used in inkjet machines. This means that there is limited opportunity to use UV inks in the new generation 6.

New requirements have been introduced for the definition of ingoing substances and impurities in chemical products, and the limit for impurities in the chemical product is 100 ppm.

Printing inks, toners, inks, varnished and adhesives must be tested for de-inkability according to INGEDE[1] and have a positive score according to EPRC[2] De-inkability Scorecard.

Updated requirements for energy use and emissions of VOC

The requirement for both energy use and emissions of VOC has been adjusted and stringent in generation 6 regarding new threshold values for the different printing methods and possibilities to be awarded points.

Use of Nordic Swan logo on printed matter

The requirement has been expanded with the possibility to use the logo on Nordic Swan- or EU Ecolabelled textile or Nordic Swan Ecolabelled construction and facade panels such as acoustic panels.

Printed matter and a Circular Economy

In addition to use of recyclable chemicals, it is also possible to obtain points for using mono substrates or substrates containing recycled material, limited waste paper and unsorted waste.

For a further description of the changes in the revised version, see the table in section 9.

2 Motivation for the Nordic Swan Ecolabelling of printing companies and printed matter

Below is a description of what characterizes Nordic Swan Ecolabelled printing companies and printed matter and the motives that apply to the product group. The description is divided into 2 product areas:

1. Printing companies
2. Printed matter

Nordic Swan Ecolabelled printing companies

Nordic Swan Ecolabelled printing companies have reduced environmental impact throughout the lifecycle through procurement of sustainably produced paper and reduced energy consumption. Environmental impact is also reduced by the use of chemicals with low environmental toxicity that do not hinder the recycling process of the printed matter.

A minimum 70% of the printing company's total annual consumption of paper is inspected or ecolabelled paper - this is to ensure that paper is produced energy-efficiently with low emissions to air and water and that the wood fibres originate from sustainable FSC or PEFC-managed forest. The printing company is awarded points for higher consumption of inspected or ecolabelled paper in the criteria.

[1] www.INGEDE.org
[2] ERPC (2017). Assessment of Printed Product Recyclability

If the printing company is printing on textile, plastic or other board material, it is awarded points for the use of mono-materials or materials containing recycled material, thereby stimulating and contributing to the circular economy in the graphic industry.

The printing companies has to comply with strict energy requirements, which includes all of the printing company purchased energy thereby also reducing the climate footprint.

In order to protect the environment/work environment, the user and the recycling process, a long list of prohibited chemicals regulates the production of printed matter. These are chemicals which are harmful to the environment and human health.

The criteria also focus on the reduction of VOC emissions and help guarantee associated benefits for worker health and for reductions in local and regional atmospheric pollution.

All printed paper matter can enter new resource loops after use, where the fibres are used in new products. Printing inks, toners, inks, varnishes and adhesives must not hinder the recycling process. In this way, the requirements help to stimulate a circular economy, save resources and reduce the amount of waste.

Nordic Swan Ecolabelled printed matter

Nordic Swan Ecolabelled printed matter has reduced environmental impact throughout the lifecycle through the procurement of sustainably produced paper, reduced energy consumption, and the use of chemicals with low environmental toxicity that do not hinder the recycling process of the printed matter.

Nordic Swan Ecolabelled printed paper matter contains a minimum of 90% inspected or ecolabelled paper to ensure that paper is produced energy-efficiently with low emissions to air and water and that the wood fibres originate from sustainable FSC or PEFC-managed forest.

Nordic Swan Ecolabelled printed textile matter contains a minimum of 90% ecolabelled textiles, ensuring that the textile is produced energy-efficiently and that the different fibres in the fabric – depending on the type of fibres – are organic, recycled or bio-based.

Nordic Swan Ecolabelled printed panels contain a minimum of 90% ecolabelled construction and facade panels, ensuring that the panels meet strict environmental requirements and consist of a high proportion of recycled or renewable materials.

In order to protect the environment/work environment, the user and the recycling process, a long list of prohibited chemicals regulates the production of printed matter. These are chemicals which are harmful to the environment and human health.

Nordic Swan Ecolabelled printed matter does not contain PVC, fragrance or scent.

2.1 UN's Sustainable Development Goals

The Nordic Swan Ecolabel actively contributes to fulfilment of Goal 12 to "Ensure sustainable consumption and production patterns".

Nordic Swan Ecolabelled printing companies have reduced environmental impact throughout the lifecycle - from production of printed matter to requirement ensuring that the product is part of today's recycling systems.

How Nordic Swan Ecolabelled printing companies and printed matter contribute to Goal 12:

Requirements for use of inspected and ecolabelled paper ensuring that the paper is produced energy efficiently with low emissions to air and water and that the wood fibres originate from sustainable FSC or PEFC managed forest contribute to sustainable management and efficient use of natural resources.

Requirements for the printing company´s total energy consumption ensuring that the printed matter is produced energy efficient thereby contributing to a sustainable management and efficient use of natural resources.

A long list of chemicals that are harmful to health and the environment are prohibited in the production of the printed matter. All the chemicals in the production of Nordic Swan ecolabelled printed matter are checked regarding their environmental and health effects.

All printed paper matter must be able to enter new resource loops after use thereby saving resources and reduce the amount of waste.

3 Environmental impact of the printing company and printed matter

The product group printing companies and printed matter comprises different printing technologies and print on different types of substrates but with a uniform function, i.e. to produce printed matter. In order to assess the different printing technologies and types of printing substrates, the functional unit is defined as one tonne purchased/used substrate.

Nordic Ecolabelling assesses a product's environmental impact throughout its life cycle. In order to achieve environmental benefits, Nordic Ecolabelling must be able to set requirements that are relevant for the environment.

To identify the most important aspects of the system for printing companies and printed matter, an MECO[3] and an RPS analysis was performed. The MECO analysis are based on several LCA studies[4][5]. Based on the MECO analysis, the RPS analysis was used to pinpoint the environmental issues that are most relevant (R) in the life cycle of the products and to assess the potential (P) which exists for reducing adverse effects on the environment. At the same time, it is important to examine how manufacturers can make changes to the products (steerability = S) that will trigger the potential for environmental improvements. This section describes the key findings of the RPS analysis.

The RPS for printing companies and printed matter is found for the following areas:

- Production of paper and other printing substrates is the main contributor to the environmental impact; therefore, the selection and the manufacturing of paper and other printing substrates have to be considered in the Nordic Ecolabelling criteria.
- Use of energy in the production of printed matter.
- Use of chemicals in the production of printed matter including
  - generation of volatile organic compounds (VOC).
  - use of chemicals that do not hinder the recycling process of the printed matter.
- Waste management - effective use of substrates/raw materials thereby reducing the amount of waste.

Use of paper and other printing substrates

Most LCA studies conclude that paper production is the main hotspot. Raw materials (paper substrate) have on average an impact contribution between 28%–78%. In most of the impact categories, this high proportion is sourced to the high paper content in the final product. Impacts from paper are mostly caused by the energy consumption in the paper mills (representing up to 70% of raw materials impacts for some studies) while the remaining 30% is mainly caused by fibre supply (biodiversity impact) and to a minor extent by consumption of other resources, such as water.

Requirement concerning consumption of sustainable produced paper are therefore highly relevant (R) and both the potential (P) and steerability (S) for setting requirements for the use of Nordic Swan- and EU Ecolabelled paper in the printing company or printed matter are high.

Digital printing, however, is far from being limited to paper-based substrates[6][7]. New digital printing and ink technologies are suitable for almost any surface such as plastic, metal, glass, wooden boards and even textiles. Such thorough studies in LCA for other print substrates have not been conducted in the same

[3] MECO stands for the assessment of Materials, Energy, Chemicals and Other characteristics and describes the principal environmental impacts during the products' life cycle phases.
[4] Antonios Konstantas et.all (November 2018): Revision of European Ecolabel Criteria for printed paper products (Preliminary report), European Commission, Joint Research Centre (JRC), Seville, Spain)
[5] https://www2.mst.dk/Udgiv/publications/2006/87-7052-173-5/html/kolofon_eng.htm#resume
[6] https://www.fespa.com/en/news-media/features/wide-format-printing-key-factors-for-sustainability-success, Visited April 2019.
[7] Viluksela P. et all (2010):Environmental performance of digital printing - Literature study.VTT2010

way as they have for paper. But there is reason to assume that other substrates than paper broadly have a similar distribution from an LCA perspective. Grakom[8] has made assessments and calculations for selected plastic substrates using ClimateCalc[9]. These calculations show that these substrates even make a greater LCA contribution than paper substrates.

As is the case with paper, there is high RPS for using Nordic Swan- and EU Ecolabelled textile or boards/panels in the printing company or in the printed matter. The great variety of substrates other than paper means it is both relevant (R) to set requirements for the use of recycled material or use of substrates that consist of one type of material to ensure recycling, and that this offers great potential (P). Requiring information on the composition of the substrates will strengthen steerability (S). This is in line with the EU strategy for plastics in a Circular Economy[10].

Use of energy in the production of printed matter

Alongside production of substrates, printing also has an important environmental contribution both regarding energy consumption and the use of chemicals. Energy savings have an important role to play in reducing environmental impact and thus also global warming and climate change. Great potential for energy savings at the printing companies is especially found within the areas of e.g. lighting, compressed air, ventilation or space heating[11].

There is both a high relevance (R) and potential (P) for limiting the energy consumption of production of printed matter. Most printing companies are focusing on their energy consumption and have good data on their energy consumption. The steerability (S) for setting absolute requirements for the consumption of energy (both the use of electricity and energy for heating) is therefore good for most types of printing companies.

Use of chemicals in the production of printed matter

As mentioned above the use of chemicals is an important contributor to the environmental impact of production of printed matter. Nordic Ecolabelling aims for the health and environmental impacts of chemicals used in Nordic Swan Ecolabelled services and in the manufacture of Nordic Swan Ecolabelled products to be as low as possible. There are high RPS for excluding or sometimes restricting the use of chemicals classified as CMR toxic- or hazardous to the environment. A clear environmental advantage for vegetable inks in comparison with mineral-based inks cannot however be stated in most of the cases[12].

Printing is also related to the generation of volatile organic compounds (VOCs). The emissions of volatile organic compounds mainly originate from the use of organic solvents and alcohol in dampening solutions. There is high RPS for reducing emissions of VOCs in the production of printed matter.

[8] Survey conducted by GRAKOM (December 2018-January 2019) for Nordic Ecolabelling. The survey was conducted on the Danish marked and focused on the use of print substrates and technologies.
[9] www.climatecalc.eu
[10] https://ec.europa.eu/environment/waste/plastic_waste.htm, visited January 2020.
[11] Energy Management Standardization in printing industry (EMSPI) conducted in 2014-2017. https://www.emspi.eu/index.html, visited May 2019.
[12] European Printing Inks Association. ENVIRONMENTAL IMPACT OF PRINTING INKS. March 2013

Recyclability is crucial for the environmental performance of paper. Recyclability in turn is linked to de-inkability[13]. De-inking on an industrial scale is highly complex since it needs to consider and address diverse types of inks, and also to remove impurities and unwanted substances. The key de-inking steps are the detachment of the ink film from the paper, ink fragmentation and removal from the pulp slurry. Requirements that ensure that the use of printing inks, toners, inks, varnishes and adhesives does not hinder the recycling process are therefore highly relevant (R) and have potential (P) for improvement for several types of inks. A requirement for a de-inkability test according to INGEDE and the EPRC Deinkability Scorecard[14] strengthens the steerability (S).

Waste management

Production of printing substrates is the main contributor to the environmental impact, and it is therefore highly relevant (R) that use of the substrates/raw materials is efficient, thereby reducing the amount of waste. This is in line with the EU's new circular economy package[15] which aims to use resources instead of depleting them further. The main cornerstones are the redevelopment of natural capital, the minimization or elimination of toxic substances and the avoidance of waste through careful recycling process design.

By setting requirements/a points system that rewards minimization of wastepaper, unsorted waste and also rewards substrates consisting of recycled material or consisting of only one material, the criteria stimulate and contribute to the circular economy in the graphics industry.

4 Justification of the requirements

This chapter presents proposals for new and revised requirements, and explains the background to the requirements, the chosen requirement levels and any changes compared with generation 5 of the criteria for Printing Companies, Printed Matter, Envelopes and Other Converted Paper Products.

4.1 Definition of the product group

The Nordic Swan Ecolabel applies to a **printing company's** * production of **printed matter.** Printing material used by the printing company must comprise **paper/paper-based substrates** or **substrates other than paper** in accordance with requirement O1. The **printing methods** must be one or several of the following: Conventional offset (sheet fed offset, heatset, coldset) water less offset, gravure printing, flexographic printing and digital printing (incl. **digital wide format printing**).

Nordic Ecolabelling also includes the production process used by manufacturers of envelopes to produce paper envelopes. Envelopes with and without flexographic printing on the inside are covered by the printing method envelope flexography in this document. Envelopes with printing on the outside are encompassed by e.g. offset printing of envelopes or digital printing.

[13] http://pub.ingede.com/en-GB/methods/, visited October 2019
[14] http://www.paperforrecycling.eu/, visited October 2019
[15] https://ec.europa.eu/environment/circular-economy/, visited October 2019

Other printed matter without printing (e.g. Post-it notes or note pads without printing) is encompassed by the same printing method as that used for printing the cover or another part of the printed matter.

Subject to agreement with Nordic Ecolabelling, printing companies may exempt the production of certain types of printed matter involving a specially demanding production process (e.g. security printing and questionnaires of pharmaceutical industry).

The following printing methods and types of printed and converted products are not eligible for a Nordic Ecolabelling licence according to criteria for "Printing Companies and Printed Matter":

- No films may be used to illustrate the printing plates - repro.
- Printing companies using the following printing methods; letterpress printing, non-digital screen printing and 3D printing.
- Packaging printed on other substrates than paper.
- Printing companies printing on textiles produced for clothing and accessories or furnishing fabrics, i.e. textiles produced for use and interior decoration in the home or in cars/boats, such as towels, bedding, curtains, tablecloths, rugs, cushions, duvets and upholstery (both for private and public use). Separate Ecolabelling criteria exist for these.

  Printing on textile for advertising such as banners, roll ups and Point of Sale (POS) is however part of these criteria.
- Printing companies printing on tissue paper (serviettes, kitchen rolls, toilet paper and similar products). Separate ecolabelling criteria exist for these.
- Printing companies printing on packaging for liquid foods. Separate ecolabelling criteria exist for these.
- Printing companies printing on disposables for food. Separate ecolabelling criteria exist for these.

* **Bold** highlighting indicates that the term is explained in the section Terms and definitions.

Background to the definition of the product group

The product group encompasses printing companies and printed matter. A printing company is a business providing printing of printed matter as a substantial part of its business. Licences to become a Nordic Swan Ecolabelled printing company cannot be issued to publishers and advertising agencies as their purpose is not to provide printing services. Printing is a process involving the processing of printing material to produce printed matter and encompassing printing on printing materials and/or finishing/converting. The processing consists of an image, pattern, picture, text or the like being printed on paper or some other printing material.

In the sixth generation of the criteria the name of the product group has changed from "Printing Companies, Printed Matter, Envelopes and Other Converted Paper Products " to "Printing companies and printed matter" in order to reflect the development in the graphic industry which increasingly focuses on printing on substrates other than paper.

The criteria still focus both on the overall environmental profile of the printing company as well as on the environmental profile of the individual item of Nordic Swan Ecolabelled printed matter.

As in generation 5 of the criteria, the printing methods must be one or several of the following: Conventional offset (sheet fed offset, heatset, coldset) water less offset, gravure printing, flexographic printing, flexographic envelope production, and digital printing. Digital printing includes several different techniques such as wide format-, inkjet-, Indigo-, screen- and dye-sublimation printing.

Printed matter includes:

- Newspapers, advertising matter, journals, catalogues, books, leaflets, brochures, pads, posters, loose-leaf's, business cards, folders, ring binders with paper contents, labels, and the like
- Envelopes and other converted printed matter.
- Stationery and office supplies, such as notebooks, exercise books, notepads, etc. that are sold by wholesalers or via the retail trade, are also classed as printed matter.
- Paper-based packaging, however not packaging for food contact.
- Banners, billboards, signs, posters, roll-ups, window/vehicle graphics and other point of sale (POS) material typically produced using wide format digital printing technology.

In case of roll-up stands, printed canvas on a wooden frame and other similar products, only the material carrying the information is regarded as printed matter. Other parts such as the metal stand or wooden frame are not covered by requirements in the criteria.

In this criteria generation 6, it has been clarified that digital wide format printing is part of the criteria which means that printed matter also includes banners, billboards, signs, posters, roll-ups and window/vehicle graphics also known as (POS=point of sale material).

Paper-based packaging designed for non-food contact made of paper and board is always recyclable. However, packaging designed for non-food contact is often produced in combination with other materials such as plastic which raise challenges int the recycling process. Therefore, packaging made of non-paper material is excluded in these criteria in order to support the concept of a circular economy.

Packaging designed for food-contact is also excluded in these criteria partly because Nordic Ecolabelling has criteria for Disposals for food and packaging for liquid food (food contact) but also to avoid the possible misunderstanding around Nordic Swan Ecolabelling of food.

Envelope production itself is performed on a flexographic printing machine which often prints on the inside of the envelope. As envelopes generate more wastepaper than, for instance, notepads and leaflets, which are also printed using the flexographic method, Nordic Ecolabelling introduced its own points limit for envelope production (flexographic envelope production).

Envelope producers must also select this category even if they produce envelopes that neither bear print on the inside or outside. As regards printing on the envelopes using offset technology the printer must use envelope offset. If the printer uses digital printing machines, then the ordinary digital printing method must be selected.

As in generation 5 of the criteria, the printing companies may exempt the production of certain types of printed matter involving a specially demanding production process (e.g. security printing and questionnaires in the pharmaceutical industry).

Printing companies using film/film production are excluded from generation 6 of the criteria. Film in repro is an old repro technology (use of both developing and fixing baths) which has been replaced by computer to plate, CTP).

Letterpress printing, non-digital screen printing and 3D printing are excluded from generation 6 of the criteria. Letterpress is an old method which, in practice, has been replaced by offset. Non-digital screen printing is uses much more ink (often done manually) compared to the digital process performed on inkjet printers. 3D printing produces 3D solid objects by building up the objects layer by layer. 3D printing is not regarded as printed matter, as the primary function of the printed objects is not that of an "information carrier".

Printing companies printing on tissue paper, disposals for food, packaging for liquid food (food contact) and textile produced for clothing and accessories or furnishing fabrics are not eligible for a Nordic Ecolabelling licence. Separate ecolabelling criteria exist for these.

4.2 Terms and definitions

Advanced energy threshold value	The Energy threshold values is based on data from Nordic Swan Ecolabelling licensees. The advanced energy threshold value represents a value which is approx. 25% below the average energy data for total energy consumption for each printing method (kWh/tonne).
Basic energy threshold value	The Energy threshold values is based on data from Nordic Swan Ecolabelling licensees. The basic energy threshold value represents a value which is approx. 25% above the average energy data for total energy consumption for each printing method (kWh/tonne).
Brokers	Companies that primarily sell printed matter opposite to publishing houses and advertising agencies that usually do not provide printing services as a substantial part of their business.
Chemical products used in the finishing of substrates other than paper	Finishing means surface treatment of the substrate (e.g. coating, printing, varnishing or adding adhesives). Requirements for chemical products used in finishing are set in requirement O6. The requirement does not apply to chemical products used in the actual manufacturing of substrates such as additives used in the manufacturing of foils or laminates or boards.
Converted printed matter	Converted printed matter means paper, board or non-paper substrates, either printed or unprinted, used, for example, to protect, handle or store items and/or notes, for which the converting process is an essential part of the production process, e.g. envelopes, stationery paper products, packaging containers or marketing displays, see also converting process.
Converting process	A process whereby a material is processed into a converted paper product. Conversion is a post-press activity that involves making a flat printed press sheet into a three-dimensional object, see also converted printed matter.

Corona treatment	Corona treatment (sometimes referred to as air plasma) is a surface modification technique that uses a low temperature plasma to impart changes in the properties of a surface. A corona treating system is designed to increase the surface energy of plastic films, foils and paper in order to allow improved wettability and adhesion of inks, coatings and adhesives. As a result, the materials treated will demonstrate improved printing and coating quality, and stronger lamination strength.
Digital wide format printing	Wide format printers (large format printers) are generally accepted to be any computer-controlled printing machines (printers) that support a maximum print roll width of between 18" (inches) and 100". Printers with capacities over 100" wide are considered super wide or grand format. Wide format printers are used to print banners, posters, trade show graphics, wallpaper, murals, backlit film, vehicle image wraps, electronic circuit schematics, architectural drawings, construction plans, backdrops for theatrical and media sets, and any other large format artwork or signage. Wide format printers usually employ some variant of inkjet or toner-based technology to produce the printed image.
EDTA	Ethylenediaminetetraacetic acid
Energy consumption	Energy encompasses all the printing company's purchases of electricity, district heating, fuel for stationary combustion plants etc., calculated as kWh of purchased energy on an annual basis per tonne of purchased substrate. This encompasses the entire production process in the form of pre-press, printing and finishing, as well as other subprocesses/functions at the printing company, such as chemical stores, paper and product stores, ventilation, lighting, internal treatment of water and emissions as well as support functions, such as offices, toilets, changing rooms and other common areas. This parameter does not include fuel, if any, used for the printer's own vehicles. Energy produced in-house from e.g. sun, wind and thermal heating will not be included, since it has not been purchased.
Energy Management Systems	An energy management system (EnMS) defines energy policy, objectives, energy targets, action plans and processes. The EnMS supports the achievement of a company's overall goals providing an organisational basis for improved energy and carbon efficiency through the measurement, monitoring, control, and improvement activities.
Foil printing	Foil printing is a speciality printing process which uses heat, pressure and metallic paper (foil). The technique is an application of metallic or pigmented foil on to a solid surface by applying a heated die on to the foil.
Functional unit	The functional unit is defined as one tonne purchased/used substrate.
Inspected paper	Inspected printing paper is paper without a Nordic Swan Ecolabelled licence that has been approved for use in Nordic Swan Ecolabelled printing company and used in printing of Nordic Swan Ecolabelled printed matter.
Laminating	Lamination means adhering a layer of plastic (polyethylene, polymerized acrylics, vinyls, styrenes, among others) to a paper material mainly to increase product durability (i.e. barrier properties or mechanical resistance).
Mesh	A polyester material that allows the air to blow through. There are crisscrossed fibres that can been seen through to some extent, but it still has a printable surface. They are commonly displayed on construction fences or sports fences. Mesh can be coated with vinyl or PVC.
Mono substrate	Mono substrate (other than paper) consist of the same material such as PE- or PP foil, PC or PS board or polyester. Substrates containing adhesives (outer layer of adhesives) such as films/laminating films or substrates coated with another material (such as PVC) are not considered to be a mono substrate. Mono substrates coated with ink are how ever considered to be a mono substrate.
Orders produced	A production order is an order issued within a company to produce a specific quantity of material within a certain timeframe.

Other substrates than paper	Other substrates than paper are often divided into flexible and rigid substrates. Flexible substrates such as foils and laminates often consist of plastic such as PVC, vinyl, PP, PE and PET, while textiles and canvas most often are used for banners and posters. Typical rigid substrates are thick plastic, board, wood, metal or glass which is often used for signs. Rigid substrates may consist of one material but are often composed of several types of material forming a composite.
Paper	A printing material assessed by Nordic Ecolabelling and the EU Ecolabel's criteria for graphic paper, e.g. printing paper, copying paper, newspaper, cardboard, paper board etc.
PC	Polycarbonate
Practising company	The business that performs the actual printing operation.
Printed matter	Printed matter is the result of the processing of a printing material. Printing includes pre-press, press, and postpress operations. The processing consists of an image, picture, pattern, text or the like being printed on paper or some other printing material. In addition to printing, the processing may include finishing, consisting of various forms of mechanical processing, such as folding, stamping and cutting or various forms of assembling, using glue, staples, stitches and the like. In the case of some printed matter, the processing is confined to finishing, i.e. it does not undergo a printing process (for example, some notepads and envelopes). Printed matter includes: - Newspapers, advertising matter, journals, catalogues, books, leaflets, brochures, pads, posters, loose-leafs, business cards, folders, ring binders with paper contents, labels and the like - Envelopes and other converted printed matter. - Stationery and office supplies, such as notebooks, exercise books, notepads, etc. that are sold by wholesalers or via the retail trade, are also classed as printed matter. - Paper-based packaging made of paper/cardboard (wood pulp). - Banners, billboards, signs, posters, roll-ups, window/vehicle graphics and other point of sale (POS) material typically produced using wide-format digital printing techniques. In case of roll-up stands, printed canvas on a wooden frame and other similar products, only the material carrying the information is regarded as printed matter. Other parts such as the metal stand or wooden frame are not covered by requirements in the criteria.
Printing company/ Printing house/Printers	A business providing printing services, where printing constitutes a substantial part of its business. Printing is done by traditional printing companies, but also by photocopying centres and other businesses carrying out printing. There may also be printing companies that do not do the actual printing themselves (**brokers**). Typical printing companies are sheet fed offset printers, rotary printers, heatset printers, newspaper printers, magazine printers, packaging printers, envelope printers, board printers, label printers, flexographic printers and digital printers (including wide format printers), but also manufacturers of envelopes and packaging as well as manufacturers of other products encompassed by the term printed matter in this document. Printing may also include finishing. Publishing houses and advertising agencies are not regarded as printing companies as they do not provide printing services as a substantial part of their business.
Printing methods	Conventional offset (sheet fed offset, heatset, coldset,) water less offset, gravure printing, flexographic printing and digital printing. Digital printing refers to printing where the complete workflow is managed using a computer. Examples of types of digital printers: -Laser printers (electrophotography). This includes monochrome copier/printers along with colour copier/printers from multiple sources, and some digital presses; -Inkjet printers. This includes desktop printers, addressing printers in-line with finishing operations, wide format printers and high-quality proofing printers, as well as some digital presses; -Thermal transfer and hot melt ink printers. This includes thermal wax and hot stick printers;

	- Dye sublimation printers. This includes some colour proofing devices and 'photo quality' continuous tone printers; - Nanography: new technology being developed by Landa, uses WB nanonink of 10nm (less pigment, better resolution)
Production chemical	Collective term for chemical products used during production. It can refer to chemical additives, auxiliary chemicals and process chemicals. Production chemicals apply to the following chemical categories: - Chemicals for form production (repro); - Printing ink, toners and Inks; - Vanishes; - Adhesives; - Washing agents, incl. washing agents used for ordinary cleaning of printing machines; - Damping solutions additives (e.g. alcohol, IPA); - Algicides and - Foil for foil printing and laminates applicable to printed paper used in production to printed matter.
PS	Polystyrene
Purchased substrates/ Consumption of substrates	The number of tonnes of substrates purchased by the printing company per year. Quantities of substrates not purchased by the practising company, but used in production, must be added. The printer may, by arrangement with Nordic Ecolabelling, omit substrates supplied by the customer where special circumstances apply. If consumption of substrates is assessed on an annual basis, storage differences must be corrected for.
Recycled material	Recycled material is defined in accordance with ISO 14021.
Release papers/-liners	Release papers/-liners are papers or films coated with a release agent (silicone) and are used in a wide range of applications such as for protection of adhesive surfaces of various adhesive products and protecting of printing surface.
Rules of Rounding	General rule of rounding e.g. 0,5 go up, so 4,5 rounds up to 5.
Substrate	Any surface or material on which printing is done.
Supplier	Enterprise that supplies products (goods or services) to the printing company. The definition is based on the definition in ISO 9000:2000.
Total consumption of substrates	See Purchased substrates.
VOC	Volatile organic compounds (VOC) are defined in accordance with European Commission's Directive 1999/13/EC on the limitation of emissions of volatile organic compounds with vapor pressure > 0.01 kPa at 20°C. See also VOC consumption.
VOC consumption	Number of kilograms of VOC used on an annual basis based on the quantities purchased/received. Washing agents, dampening solution additives, printing inks and other chemicals may contain VOC. Some washing agents consist entirely of VOC. Storage differences can be corrected for. The electronic application aid shows how much VOC is present in the various chemicals. When calculating VOC emissions, printing companies disposing of this under controlled conditions may deduct the VOC disposed of from their VOC consumption in accordance with Appendix 5 in the criteria document. This, for instance, applies to printing companies that clean outgoing air for VOC (typically heatset printers). In the case of heatset the correction must take account of the result of measurements of point releases of VOC.
Wood-based panels/boards	Typical wood-based panels/boards are chipboard, fibreboard (including MDF and HDF panels), OSB (Oriented Strand Board), veneer plywood and veneer boards. The requirements also include corresponding products made of bamboo. Wood-based panels/boards does not include boards made of wood pulp (paper).

4.3 Description of the product/service

O1 Type of printing company

- The printing company must give a brief account of the number of printing machines, the type of machine or model (e.g. heat set press, flexography machine, flatbed), size (e.g. number of ink and varnish units), format (e.g. 48 pages) and machines for prepress and potential finishing services.
- At least 50% of the printing company's turnover must originate from **paper printed matter**, Nordic Swan- or EU Ecolabelled textile or Nordic Swan Ecolabelled construction and facade panels manufactured using **printing methods** encompassed by the criteria.

✉ A brief description of the number of printing machines, the type of machine or model (e.g. heat set press, flexography machine), size (e.g. number of ink and varnish units), format (e.g. 48 pages), machines for pre-press and potential finishing services.

✉ Information on the printing company´s total turnover as well as turnover from paper printed matter, Nordic Swan- or EU Ecolabelled textile or Nordic Swan Ecolabelled construction and facade panels.

Background to requirement O1

As in generation 5, a minimum of 50% of the printing company's turnover must derive from printed matter printed on paper substrates. In this generation, the choice of substrates has been expanded to also include Nordic Swan- or EU Ecolabelled textiles[16] or Nordic Swan Ecolabelled construction and facade panels[17].

The minimum requirement of 50% is introduced for reasons of credibility, as the potential environmental impacts of paper production in a life cycle perspective including impacts of the printing house and those associated with printed paper products are well known and analysed. The same applies to the production of Nordic Swan- or EU Ecolabeled textiles or Nordic Ecolabelled construction and facade panels.

This 50% must be calculated based on the printing company's turnover from printing. Consequently, turnover from other activities, such as layout work, web design, etc., does not count. This is because the criteria cover printing, for which reason it is not credible for a Nordic Swan Ecolabelled printing company to market other activities as being Nordic Swan Ecolabelled.

4.4 Suppliers

The applicant must document the supplier requirements for the printing company, i.e. not for each individual printing method.

[16] Both the Nordic Swan Ecolabel and the EU Ecolabel have criteria for textile that includes several relevant print substrates such as polyester or canvas. Visit the relevant national websites for information on labelled textiles.
[17] The product group includes several relevant print substrates such as wood-based panels/boards. Visit the relevant national websites for information on labelled construction and façade panels.

O2 Suppliers of printing services

At least 95% by weight of all printing on substrates in-house by the **printing company** and printing of the printing company's printed matter externally by **suppliers**, must be by Nordic Swan Ecolabelled printing companies.

The percentages must be calculated based on **total consumption of substrates (**tonnes) in-house and consumption of substrates (tonnes) by suppliers on an annual basis or based on an assessment using financial figures. The documentation must consist of a calculation in accordance with the requirement outlined above.

✉ List of external suppliers of printing services and a specification of the quantities (tonnes of paper annually) sent to print suppliers.

✉ Calculation showing compliance with the requirement.

Background to the requirement

The requirement on suppliers of printing services has been made more stringent, increasing from 75% to 95% by weight in generation 6. Nordic Ecolabelling has experienced an increasing interest from printing companies or brokers, who does not actually engage in the printing process to produce the printed matter themselves, to be Nordic Swan Ecolabelled, i.e. companies that primarily sell printed matter opposite to publishing houses and advertising agencies that usually do not provide printing services as a substantial part of their business. In order to ensure that the printing companies or brokers do not choose to collaborate with a printing company with less focus on the environment, almost all (min. 95% by weight) printing must be by Nordic Swan Ecolabelled printing companies.

Data from the Nordic Swan Ecolabelled printing companies show that most of all external suppliers are Nordic Swan Ecolabelled.

O3 Chemical finishing services (book binding)

At least 95% by weight of the chemical finishing, in-house at the printing company as well as out-of-house by suppliers, must be inspected (calculated as a total as all categories receive finishing treatment). Chemical finishing involves adhesives, varnishing, **foil printing** or laminating, as well as washing agents used for ordinary manual cleaning of print finishing machines. An "inspected supplier" of finishing services is inspected by Nordic Ecolabelling and complies with the requirements of Appendix 3.

The percentage share is calculated on the basis of the number of tonnes of substrates for in-house chemical finishing and tonnes of substrates for externally inspected finishing.

The printing company need not secure inspection of out-of-house finishes if only 5% or less of all orders undergo chemical finishing, calculated as substrates used in relation to total substrates consumption. However, see requirements regarding out-of-house finishing of Nordic Swan Ecolabelled printed matter in requirement O29.

Suppliers of mechanical finishing services are not encompassed by this requirement.

For a supplier with finishing services to be registered in the electronic application aid, the supplier must complete and submit the declaration in Appendix 3.

The documentation must consist of a calculation in accordance with the requirement outlined above.

✉ Complete the electronic application aid by selecting inspected finishers from a list and specifying quantities.

Background to the requirement

The requirement has been tightened up from 90% to 95% in generation 6 of the criteria as most printing companies, both in-house chemical finishing and use of finishing suppliers, are very close to 100%.

Chemical finishing in these criteria encompasses adhesives, varnishing, foil blocking or laminating on printed matter or its packaging. As a new addition in generation 6 of the criteria, washing agents used for ordinary cleaning of print finishing machines, have also been included, as these chemicals are covered by the requirements applicable to chemicals at the printing company.

The triviality threshold of a maximum of 5% by weight is to avoid unnecessary administration. In other words, the requirement ceases to apply in its entirety if external chemical finishing is conducted on a maximum of 5% by weight calculated as purchased substrates for orders for external chemical finishing in relation to total consumption of substrates.

4.5 Printing substrates

The requirements O4 to O8 apply to all printing substrates purchased annually by the printing company. The requirements for substrates are divided into requirements which include substrates of paper and requirements for substrates other than paper.

Table 1: Overview on printing substrates and specific requirements

O4 Printing Substrates - Applies to all annually purchased substrates		
P1 Printing substrates - The printing company can earn up to 5 points in P1 depending on the quantity of purchased paper		
O5 Inspected and Ecolabelled paper		**O6 Other substrates than paper** - Applies to all substrates other than paper
The printing company can earn up to 8 points in P2, depending on the quantity of Inspected/ Ecolabelled paper used		
P2 Inspected and Ecolabelled paper		**O7 Textiles** - only applies if printing on textiles
		O8 Panels/boards made of wood - only applies if printing on panels/boards of wood
		The printing company can earn up to 10 points for P3, P4 and P5, based on the types of substrate used
		P3 Content of recycled materials
		P4 Mono materials
		P5 Recycled material and mono substrates

For a paper grade to be inspected and available for the printing company, the paper mill must document compliance with the requirements set for paper in the Appendix 1 in Paper Products - Basic Module. More information can be found from http://www.nordic-ecolabel.org/certification/paper-pulp-printing/

For a printing substrate other than paper to be inspected and available for the printing company, the manufacturer/supplier must document compliance with the requirements using Appendix 2.

O4 Printing substrates

The printing company must state all printing substrates purchased annually including trade name, supplier, quantities and grades.

The description shall include calculation of:

- the total number of tonnes of substrates purchased annually;
- the total number of purchased tonnes of substrates of paper and substrates other than paper respectively;
- the total consumption of tonnes of substrate for each individual printing method.

If relevant, provide a description how potential adjustment of stock difference is carried out.

If a printing company uses a certain paper grade in several printing methods, the volumes for paper, may be estimated in relation to printing methods respectively.

If envelopes are printed on offset machines, envelopes shall be included as part of the sheet offset method (and not calculated as a separate method). If packaging is printed, then the packaging must be included as part of the printing method used.

✉ Documentation that the requirement is met. Select substrates from a list, specifying quantities and upload reports/lists from suppliers of substrates detailing the quantities and grades purchased annually.

P1 Printing substrates

The printing company may be awarded points depending on the proportion of purchased paper in relation to the total purchase of tons substrates annually.

*Example: If the printing company purchase 40 tons of paper and 5 tons of substrates other than paper annually (total of 45 tons), the company achieves (40/45) * 100 = 89 % = 3 points.*

Table 2: P1 Example of points.

Proportion of purchased paper in relation to the total purchase of tons substrates annually	Points
0 - 50 %	0
51 - 60 %	1
61 - 70 %	2
71 - 90 %	3
91 - 99 %	4
100%	5

✉ See O4.

Background to the requirement

The requirement has been adjusted in generation 6 regarding the functional unit that has been changed from number of tons of produced product to purchased tonnes of substrate. The requirement now also includes annual purchase of substrates other than paper, in order to reflect the development in the graphic industry. Therefore, Nordic Ecolabelling also need to get information on the total number of annual purchased tonnes substrates other than paper.

Not all types of substrates are traded in weight (kg or tonnes) but in area or square meter. In these cases, the product must be weighed or estimated.

In most cases the paper grades are supplied in a format suitable for the printing method in question. Information about which formats have been supplied to which printing company is typically held by paper wholesalers. Printing companies using both sheet-fed offset and digital printing may cut up some of the sheet-fed offset paper and use it for digital printing, and the printing company may estimate the quantity in such cases.

The printing company may be awarded points depending on the proportion of purchased paper in relation to total purchase of tons substrates annually. The requirement is introduced for reason of credibility, as the potential environmental impacts in a life cycle perspective of paper production including the printing house impacts and those associated with printed paper products are well known and analysed in contrast to substrates other than paper.

4.5.1 Paper

O5 Inspected and Ecolabelled paper

At least 70% of the printing company's total annual consumption of paper must be inspected or ecolabelled. In this calculation, Nordic Swan Ecolabelled paper has a weight of 1, inspected paper 0.9 and EU Ecolabelled paper 0.8.

Example: If 70% inspected paper is used in addition to 10% Nordic Swan Ecolabelled paper and 5% EU Ecolabelled paper, the calculation will be as follows: 70*0.9 + 10*1.0 + 5*0.8 = 77%

If only a single type of paper is used, 70% Nordic Swan Ecolabelled paper or 78% inspected paper or about 87.5% EU Ecolabelled paper will be required for the requirement to be fulfilled.

✉ Complete the electronic application aid by selecting paper from a list, specifying quantities and uploading reports/lists from paper suppliers detailing the quantities and grades purchased during the course of the year. Also upload valid licence documentation for EU Ecolabelled paper if the paper is not already available in the list for selection. Valid licence documentation consists of the annex to the contract including trade names or a valid certificate including trade names.

✉ See P2.

P2 Inspected/ecolabelled paper

The printing company may be awarded points depending on the quantity of inspected/ecolabelled paper purchased/used annually.

Use the formula below to calculate points for inspected/ecolabelled paper on an annual basis. The quantity of inspected/ecolabelled paper is weighted in such a way that Nordic Swan Ecolabelled paper has a weight of 1, inspected paper 0.9 and EU Ecolabelled paper 0.8.

A paper quality can only count once (the highest weighting applies if, for instance, the paper is both Nordic Swan Ecolabelled and EU Ecolabelled at the same time). The weighting is based on differences between the stringency of the requirements.

Use the following formula to calculate the percentage of the total paper consumption that is approved/ecolabelled paper on an annual basis:

Score = (proportion of Nordic Swan Ecolabelled paper * 1) + (proportion of inspected paper * 0.9) + (proportion of EU Ecolabelled paper * 0.8)

*Example: If 70% inspected paper is used in addition to 10% Nordic Swan Ecolabelled paper and 5% EU Ecolabelled paper, the calculation will be as follows: (70*0.9+10*1.0+5*0.8) = 77% = 2p*

Table 3: P2 Examples of points.

Proportion of inspected/ecolabelled paper	Points
71 - 74	0
75 - 80	2
81 - 90	4
91 - 99	6
100	8

The documentation must consist of a calculation in accordance with the above option for scoring points and reports/lists from the paper suppliers stating quantities purchased and grades during the year. Please follow the instructions below regarding the electronic application aid when preparing the application.

✉ Select paper from a list, specifying quantities and uploading reports/lists from paper suppliers detailing the quantities and grades purchased during the course of the year. Also upload valid licence documentation for EU Ecolabelled paper if the paper is not already available in the list for selection. Valid licence documentation consists of the annex to the contract including trade names or a valid certificate including trade names.

Background to the requirement

The requirement regarding inspected and Ecolabelled paper has been made more stringent in generation 6, but the structure remains the same. The proportion of the printing companies' total annual consumption of inspected and ecolabelled paper has been changed from 25% to 70% (O5). The printing company may be awarded points depending on the quantity of inspected/ecolabelled paper used (P2).

Manufacturing of paper is the main environmental and resource-related burden in the life cycle of printed matter, as described in section 3. The strengthening of the requirement is in line with the LCA findings. The proposed limit of at least 70% is based on data from Nordic Swan Ecolabelled printing companies.

As in generation 5 of the criteria, Nordic Swan Ecolabelled[18],- inspected- and EU Ecolabelled paper[19] is weighted with different factors based on an overall assessment of the level of requirements. The primary difference between Nordic Swan- and EU Ecolabel is requirement levels for energy use, stringent threshold values for emission to air/water and emission of AOX. As a result, Nordic Swan Ecolabelled paper is weighted with a factor of 1, Inspected paper with a factor of 0.9 and EU Ecolabelled paper with 0.8. If a paper type carries both marks, the highest weighting factor may be applied.

The levels of requirements are assessed by comparing the proposal for new Nordic Swan Ecolabelled criteria for paper products (generation 3) (currently under revision) and the EU Ecolabel requirement levels for graphic paper[20].

[18] Proposal for new Nordic Swan Ecolabelled criteria for copy and printing paper, generation 5.
[19] EU Ecolabelled criteria for Graphic Paper EU, adopted 11 January 2019
[20] http://ec.europa.eu/ecat/category/en/3/copying-and-graphic-paper

4.5.2 Other substrates than paper

The requirement includes all **substrates other than paper**. Requirement O6 applies to all substrates other than paper, while requirements O7 to O8 are additional requirements to specific types of substrates.

O6 Other substrates than paper

This requirement includes the printing company's total annual consumption of substrates other than paper.

The following complies to all substrates other than paper:

a) All **chemical products used in the finishing of the substrate** must document compliance with the requirement in appendix 2.

Finishing means surface treatment of the substrate and involves adding coating, printing, varnishing or adhesives to the substrate.

b) Substrates, including **release paper/liner**, must not contain halogenated organic compounds (includes chlorinated polymers). For example: PVC/PVC coating, organic chloroparaffins, fluorine compounds and flame-retardants*.

** Flame retardants: Exceptions are made for textile substrates certified class B1 according to DIN4102-1, M1 according to NFP 92503 or EN13501-1.*

Trivial limits:

Up to 10% of the printing company's total annual consumption of substrates other than paper is exempted from the requirement.

*Example of how to calculate the trivial limit: If a printing company's annual consumption of substrates other than paper is 50 tonnes, the calculation will be as follows: (50 * 10%) = 5 tonnes.*

In order for the printing substrate other than paper to be inspected and recorded in the electronic application aid, the manufacturer/supplier must document compliance with the requirements using Appendix 2.

The documentation must consist of a calculation in accordance with the requirement above and reports/lists from the suppliers of substrates stating type/material/quantities purchased during the year.

✉ Complete the electronic application aid by selecting substrates from a list, specifying quantities and uploading reports/lists from suppliers detailing the quantities purchased during the course of the year.

Background to the requirement

This requirement on substrates other than paper has been restructured in generation 6 of the criteria. In generation 5, up to 25% of all substrates other than paper were exempted from the requirements. In generation 6, only up to 10% of all substrates other than paper are exempted from the requirements.

Developments in the graphic industry show an increasing interest for printing in substrates other than paper such as plastic, fabric/textiles, metal and wood[21][22]. Compared to paper, knowledge of these materials is relatively limited in terms of production process, environmental impact and the circular economic potential of the materials.

[21] Survey conducted by GRAKOM (December 2018-January 2019) for Nordic Ecolabelling. The survey was conducted on the Danish marked and focused on the use of print substrates and technologies.
[22] 2018 Intergraf economic report

Contact with the graphic industry shows that for certain product groups, e.g. signs, there are several types of substrates and materials to choose from, while substrates for other product groups are product specific, e.g. foils. Substrates are often coated on one side (to improve printing properties) just as adhesives are typically used on one side of foils and laminates, see table 4 below. The wide variation in materials and material composition presents challenges for the recycling industry[23].

Nordic Ecolabelling wants to stimulate and contribute to the circular economy of graphic products by excluding environmentally problematic chemicals and materials in the substrates, as well as encouraging the use of mono substrates and recycled materials.

Organic compounds containing halogenated compounds such as chlorine, bromine, fluorine or iodine must not be present in any substrates other than paper. Halogenated organic compounds encompass a wide range of substances harmful to health and the environment, they are very toxic to aquatic organisms, carcinogenic or harmful to health in other ways. The halogenated organic compounds do not break down readily in the environment, which increases the risk that the substances will have harmful effects. The requirement is therefore imposed that halogenated organic compounds must not be present in the substrates. This means, inter alia, that halogenated flame retardants, chloroparaffins, perfluoroalkyl compounds and PVC must not be present in any type of substrate.

Halogenated compounds such as PVC are widely used within all types of substrates, typically as a coating, but also as an integrated part of the substrates e.g. vinyl and **mesh** banners. The supply of PVC-free substrates is how ever growing in all types of substrates and Nordic Ecolabelling therefore proposes a general ban on the use of PVC in all types of substrates.

PVC leads to adverse environmental impacts in waste handling. The most important problem areas for PVC are described in Nordic Ecolabelling's background report for floors[24]. PVC contains chemicals that may have adverse health effects:

- Exposure to PVC often includes exposure to phthalates and chlorine.
- Manufacturing, burning, or landfilling PVC releases dioxins.
- Phthalates, dioxins, and BPA are suspected to be endocrine disruptors. Endocrine disruptors are chemicals that may interfere with the production or activity of human hormones

Table 4: Overview of the commonly used types of substrates (other than paper) - materials used in the substrates - typical chemicals used in the processing of the substrates and general recyclability of different types of substrates/materials.

Type of substrates	Substrates and materials	Processing of the substrates	Waste and recyclability	
Film/foil and laminated	**Plastic:** PVC, Vinyl, PE, PP, PET, PU (polyurethane)	-Transparent or -Coating of front materials in different colours (often white)	Mono plastic without adhesive	Good
			Foil and laminates with adhesive	Problematic

[23] Dialog with Stena Recycling and Rangsells 2019
[24] http://www.nordic-ecolabel.org/product-groups/group/?productGroupCode=029 (visited August 2019)

	Release liner: Silicone coated PE or paper	(Gloss, Matt, semi Matt), UV-coating -Adhesive (permanent, removable)	Soft PVC and vinyl	Problematic
			Silicone coated PE or paper	Problematic
Signs	**Composite:** Alu composite (core in PE, PUR, PS, PVC) Paper composite (core in PE, PUR) **Release liner:** Silicone coated PE or paper	Front material may be coated in different colours or varnishes	Composite	Problematic
			Alu composite	Possible to recycle Alu
			Silicone coated PE or paper	Problematic
	Same material: Wood, paperboard, metal (Alu), PVC, Acrylic, PS, PC, PET, PP, Styrene, PUR	May be coated in different colours or varnishes	Mono materials with/without print	Good
Textile	**Same material:** 100% polyester Canvas Cotton	Without coating May be coated with vinyl or PVC	Mono materials with/without print Materials coated with vinyl/PVC	Possible Problematic
	Composite: PE/cotton, PET/cotton	May be coated with vinyl or PVC	Materials coated with vinyl/PVC	Problematic

Temporary textiles (or soft signage) is the term for flexible advertising signage and interior decoration that is printed on textiles – mostly polyester and some types of canvas. Whenever cloth, fabrics or textiles are used in public buildings, hotels or at public events it mandatory in some countries[25] to provide a flame-retardant certificate such as B1 according to DIN4102-1, M1 according to NFP 92503 or EN13501-1. This mandatory requirement does not apply in the Nordic countries but may be a requirement for specific events. Substrates certified as B1 according to DIN4102-1, M1 according to NFP 92503 or EN13501-1 are therefore exempted from the requirement for no use of halogenated flame retardants. However, the textile/fabric has to comply with requirement O7 (certified fabrics) which contains requirements for the use of specific types of flame retardants.

Release papers/-liners are papers or films coated with a release agent (silicone) and are used in a wide range of applications such as for the protection of adhesive surfaces of various adhesive products and protecting of the printing surface. There are two types of base materials: paper or plastic (film). Typical films are made of PE or PET, but PVC is also being used. The requirement is therefore imposed that halogenated compounds, e.g. PVC, must not be present in the release paper/-liner.

Chemical products used in the finishing of the substrate must fulfil the chemical requirement O10. Finishing means surface treatment of the substrate and involves adding coating, printing, varnishing or adhesives to the substrate.

[25] It is stipulated in current requirements in technical regulations in German, France, Belgium and Luxemburg that decoration materials used by exhibitors, event organizers, stand construction companies and service companies have to be flame retardant in compliance with DIN 4102, NFP 92503 or DIN EN 13501-1

This includes, for example, adhesive use on the surface of foils/laminates in relation to a release paper/liner, the coating of any surface of substrates, but not adhesives used to glue two type of substrates together to produce a composite.

Up to 10% of the printing companies' total annual consumption of substrates other than paper is exempted from the requirement. The exemption means that it is possible to use a limited number of substrates containing PVC or vinyl. PVC is still widely being used as a substrate intended to be used outdoors.

4.5.3 Fabrics/textiles

The requirement only applies to printing on fabrics/textiles used for advertising such as roll-ups, banners or signs. Printing on textiles produced for clothing and accessories or furnishing fabrics is not part of this ecolabelling criteria. See section 4.1, Product definition.

O7 Fabrics/textiles (e.g. polyester, canvas)

At least 50% of the printing company's total annual consumption of fabrics /textile substrates (e.g. polyester, canvas) must be Nordic Swan- or EU Ecolabelled, Oeko-TEX 100 (class IV) or GOTS certified.

✉ Complete the electronic application aid by selecting textile from a list, specifying quantities and uploading reports/lists from suppliers detailing the quantities purchased during the course of the year.

✉ Valid certificate from Nordic Swan Ecolabel textile, EU-Ecolabel or Certificate from Oeko-Tex 100 (class IV) or GOTS.

Background to the requirement

This is a new requirement in generation 6 of the criteria. Fabrics used for printing are typically manufactured from plant-based materials such as cotton (canvas) or synthetic materials such as polyester or polyamide. If the printed fabric is intended for outdoor use, it is typically coated with vinyl or PVC. Fabrics are typically used for banners, roll-ups, display systems, flags or signs and the primary fabrics used are 100% polyester.

Textile production impacts the environment in many ways. An LCA study from 2016[26], that also included the environmental impact from chemicals, concludes that the greatest environmental impact from textiles is linked to the actual production of the textile.

The global textile industry uses many different labels focusing on the environment, health and working conditions. Some of the brands are what are known as type 1 eco-labels[27], such as the Nordic Swan, the EU Ecolabel and GOTS[28]. Here, the entire life cycle of the product is assessed, and the requirements are set for the life cycle steps where relevant and possible. Other brands such as OEKO-TEX standard 100[29] focus on the content of chemicals in the finished product.

[26] Advancing life cycle assessment of textile products to include textile chemicals, Chalmers University of Technology 2016
[27] Type 1 eco-labels are based on the ISO 14024 standard and set requirements to the relevant environmental parameters.
[28] https://www.global-standard.org/the-standard/general-description.html, visited August 2019
[29] https://www.oeko-tex.com/en/, visited August 2019

Dialogue with suppliers/distributers of fabrics/textiles to the printing industry shows that OEKO-TEX 100 (class IV) certified fabrics are widely used in the market. OEKO-TEX works with 4 classes according to the textile's future utilisation. Class IV refers to decoration materials. GOTS, Nordic Swan and EU ecolabelled fabrics are also available on the market.

The proposed requirement on at least 50% certified fabrics/textiles (50% of the printing companies' total annual consumption of fabrics) is based on the wide distribution of labelled fabrics (especially OEKO-TEX 100 certified fabrics) on the market. The requirement of 50% makes it possible for the printing company to print on a limited amount of non-certified fabrics or PVC/vinyl coated fabrics such as **mesh**.

4.5.4 Panels/boards made of wood

The requirement applies to **wood-based panels/boards** such as chipboard, fibreboard (including MDF and HDF panels), OSB (Oriented Strand Board) and veneer boards. The requirements also include corresponding products made of bamboo.

Nordic Ecolabelled panels/boards made of wood fulfil the requirement automatically. Only the manufacturer, licence number and product name must be stated.

O8 Panels/boards made of wood

At least 50% of the printing company's total annual consumption of panels/boards must be;

- Nordic Swan Ecolabelled or
- FSC- or PEFC certified.

The FSC or PEFC certified panels/boards must not contain tree species listed on Nordic Ecolabelling's list of prohibited tree species*.

* The list of prohibited tree species is located on the website: www.nordic-ecolabel.org/wood/

The documentation must consist of a calculation in accordance with the requirement above and reports/lists from the suppliers of substrates stating type/material/quantities purchased during the year.

✉ Valid certificates from Nordic Swan Ecolabel or licence number and product name.

✉ Complete the electronic application aid by selecting panels/board of wood from a list, specifying quantities and uploading reports/lists/invoices from suppliers detailing the quantities purchased during the course of the year.

✉ Declaration from the manufacturer/supplier of FSC or PEFC certified panels/boards that the requirement regarding tree species not permitted to be used in wood-based panels/boards is met. Appendix 2 shall be used.

Background to the requirement

This is a new requirement in generation 6 of the criteria. Wood-based panels such as chipboard, fibreboard (including MDF and HDF panels), OSB (Oriented Strand Board) and veneer boards are an important resource used for producing printed matter, especially signs.

The proposed requirement that at least 50% of the printing companies' total annual consumption of panels/boards made of wood must be FSC- or PEFC certified or Nordic Swan Ecolabelled is based on the wide distribution of labelled panels/boards made of wood on the market.

Manufacturing of wood-based panels represents, like paper manufacturing, the main environmental and resource-related burden in the life cycle of printed matter, as found in most LCA studies analysed. One of the main environmental impacts in the manufacturing of wood-based panels is deforestation and potential loss of biodiversity from sourcing of raw materials[30].

The requirement for fibre raw material follows Nordic Ecolabelling's general forestry requirements[31]. Nordic Ecolabelling's forestry requirements focus on sustainable forestry and traceability of the wood raw material. By requiring that the wood raw material comes from FSC and PEFC certified forestry, Nordic Ecolabelling supports the drive towards more sustainable forestry. The requirement for FSC or PEFC-certified panels/boards makes it easier for the printing company to document the requirement, as it can demand and use labelled FSC/PEFC wood-based panels.

Nordic Ecolabelling's updated list of prohibited tree species was sent out for open consultation in spring 2019 and is currently in the review process. Therefore, no consultation is requested regarding the tree list in this open consultation of criteria for printing companies and printed matter.

Nordic Ecolabelling criteria for Construction and facade panels covers several types of panels/boards made of wood.

4.5.5 Points for types of substrates other than paper

The printing company can earn up to 10 points for P3, P4 or P5, based on the types of substrate used. A substrate can only obtain points from either P3 or P4 or alternative P5.

P3 Content of recycled materials

The printing company may be awarded points depending on the annual consumption of substrates other than paper containing **recycled material**.

Substrates that can be awarded points must contain minimum 50 w% recycled material*.

Substrates containing recycled PVC cannot be awarded points.

** Recycled material is defined in accordance with ISO 14021:*

"Pre-consumer": Material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

[30] http://www.nordic-ecolabel.org/product-groups/group/?productGroupCode=010, visited September 2019

[31] http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements/

Nordic Ecolabelling considers rework, regrind or scrap, which cannot be reused directly in the same process, but requires a reprocess (e.g. in the form of sorting, re-melting and granulation) before it can be reused, to be pre-consumer material. This is regardless of whether it is done in-house or externally.

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

*Example: If the printing company purchase 50 tonnes of substrates other than paper a year and 3 tonnes of the substrates meets requirements for recycled material, the company achieves (3/50) *100 = 6% = 1 point.*

Table 5: P3 Example of points.

Proportion of substrates containing recycled material / Substrates other than paper on an annual basis	Points
0 - 4%	0
5 - 10%	1
11 - 25%	2
26 - 50%	3
51 - 99%	4
100%	5

The manufacturer of the substrate must document the composition of the substrate according to the requirement.

✉ The manufacturer of the substrate shall demonstrate compliance with the requirement by duly completing the declaration in appendix 2.

✉ The manufacturer of the substrate shall enclose product data sheets or other documentation for content of pre- and post-consumer recycled material in the product.

✉ The documentation must consist of a calculation in accordance with the requirement above and reports/lists from the suppliers of substrates stating type/material/quantities purchased during the year.

P4 Mono substrates

The printing company may be awarded points depending on the annual consumption of substrates other than paper consisting of only the same type of material (**mono substrate**).

Mono substrates made of PVC cannot be awarded points.

*Example: If the printing company purchases 50 tonnes of substrates other than paper a year and 3 tonnes of the substrates meet requirements for mono substrate, the company achieves (3/50) *100 = 6% = 1 point*

Table 6: P4 Example of points.

Proportion of substrates that consist of the same type of material on an annual basis	Points
0 - 4%	0
5 - 10%	1
11 - 25%	2
26 - 50%	3
51 - 99%	4
100%	5

The manufacturer of the substrate must document the composition of the substrate according to the requirement.

- ✉ The manufacturer of the substrate shall demonstrate compliance with the requirement by duly completing the declaration in appendix 2.
- ✉ The manufacturer of the substrate shall enclose product data sheets.
- ✉ The documentation must consist of a calculation in accordance with the requirement above and reports/lists from the suppliers of substrates stating type/material/quantities purchased during the year.

P5 Recycled material and mono substrates

The printing company may be awarded points depending on the annual consumption of mono substrates other than paper containing recycled material e.g. a PE foil containing minimum 50 w% recycled material.

Definition of substrates containing recycled material, see P3.

Table 7: P5 Example of points.

Proportion of substrates that consist of both recycled material and consist of the same type of material	Points
0 - 4%	0
5 - 10%	2
11 - 25%	4
26 - 50%	6
51 - 99%	8
100%	10

The manufacturer of the substrate must document the composition of the substrate according to the requirement.

- ✉ The manufacturer of the substrate shall demonstrate compliance with the requirement by duly completing the declaration in Appendix 2.
- ✉ The manufacturer of the substrate shall enclose product data sheets.
- ✉ The documentation must consist of a calculation in accordance with the requirement above and reports/lists from the suppliers of substrates stating type/material/quantities purchased during the year.

Background to P3, P4 and P5

This is a new requirement in generation 6 of the criteria. The use of new digital printing techniques has made it possible to print on virtually all substrates/types of material. However, the types of material used in substrates are developing significantly faster than the knowledge of the material's circular economic potential. By introducing a points system that rewards substrates consisting of recycled material or consisting of only one material, the criteria encourage and contribute towards the circular economy in the graphic industry.

The market for substrates other than paper, made of recycled material or containing recycled material is still very limited. Recycled material is typically being used within signage, e.g. panels and boards containing recycled plastic or wood, or other advertising products such as banners/roll-ups containing typically recycled polyester. Some substrates are made from 100% recycled material such as acrylic or polystyrene while others contains a proportion of recycled material.

Substrates that can be awarded points must contain a minimum of 50 w% recycled material. The limit of 50% w% is determined from the standpoint of credibility. Recycled material is defined in accordance with ISO 14021.

With a circular economy approach, it is quite clear that compound materials (combine two or more sub-materials), are hard or even impossible to recycle, and are best avoided. This is even more important in the context of the large amount of materials created for many popular wide-format applications. A billboard or window wrap for an office building may easily amount to a few hundred, or even thousands of square metres of foil waste after use. As a single origin material, the foil is a valuable raw material for recycling.

Substrates containing adhesive such as films/laminating films, composite boards or substrates coated with another material (such as PVC) are not considered as a mono substrate. Mono substrates coated with ink is considered as a mono substrate as it does not cause problems in the recycling process.

PVC is still widely used as a substrate or as a coating for substrates. There are usually PVC-free alternatives available, including textiles for soft signage applications to replace posters and signage printed on PVC foils. But these are likely to be more expensive and are therefore deselected. PVC leads to adverse environmental impacts particular in waste handling and contains substances with adverse health effects. Substrates containing recycled PVC or mono-substrates made of PVC are therefore not awarded points in either P3, P4 or P5.

4.6 Requirement for paper-based packaging

The requirement only applies to paper-based packaging manufactured (as a whole) in the printing company.

O9 Requirement for paper-based packaging

The following applies to paper-based packaging manufactured (as a whole) in the printing company:

- The non-paper product parts of paper-based packaging such as metal clips, tape or plastic covers, shall be easily removable to ensure that those components will not hinder the recycling process.
- Avoid plastic labels if possible and use direct print or paper labels. If a window is needed, then provide clear instructions for consumers to remove window film before recycling.
- PVC or plastic based on other types of halogenated plastics, including tape, must not be used.
- Paper or board laminated on both sides must not be used.
- Wax or latex coatings must not be used.

✉ The printing company shall demonstrate compliance with the requirement by duly completing the declaration in Appendix 4.

Background to the requirement

This is a new requirement in generation 6 of the criteria. The requirement for paper-based packaging supports and improves the recyclability of paper-based packaging products in the paper recycling process.

Paper-based packaging is already a successful option due to a currently functioning, self-sustaining, economically viable recycling loop. The requirement is applied to paper-based packaging manufactured as a whole at the printing company.

On a European average, paper and board packaging has the highest recycling rate. According to EUROSTAT[32], the 2016 recycling rate for paper-based packaging was 84.8%. The biggest potential for improvement in paper recycling lies in the development of separate collection[33]. While separate collection should be further promoted, the aspect of increasing the functional properties of paper-based packaging should always consider the end-of-life fate of the product so as to optimise its recyclability. It is therefore important to raise awareness of the recyclability potential in the design phase of paper-based packaging. Communication between actors in the value chain is key in order to ensure accurate fulfilment of the legal requirements and to further increase the recycling of paper through design, innovation and investment.

In essence, paper and board are recyclable. Their combination with other materials, which is sometimes necessary to provide certain functions of packaging, can raise challenges in the recycling process such as plastic parts/films/labels, metal parts, wax/latex coatings or use of specific adhesives.

Plastic films used in lamination act as a barrier to the penetration of water in the recycling process, causing low re-pulpability. This leads to loss of fibres and hence low yield from the recycling process. Double lamination leads to even less re-pulpability. Therefore, laminates shall only be used when it is necessary to provide a certain packaging function, and where used, the lamination or plastic labels shall be easily removable to ensure that those components will not hinder the recycling process. Paper laminated on both sides must not be used as it is not recyclable in today's recycling/de-inking mills.

PVC or plastic based on other types of halogenated plastics, including tape, must not be used as it leads to adverse environmental impacts, see O6.

Wax or latex coatings are primarily being used in packaging with food contact. Typical waxes are different types of silicone or latex coatings and are used to protect the paper when exposed to water. However, wax or latex coated paper is not recyclable in today's recycling/de-inking mills and therefore excluded in the requirement.

Printing inks, varnishes, adhesives and other types of chemicals also affect the recyclability of paper-based packaging and the manufacturer of the packaging therefore has to be aware of the chemical requirements O10.

The requirement supports the overall CEPI recycling guidelines for paper-based packaging[34].

4.7 Chemical requirements

The chemical requirements apply to the following categories of production chemicals:

- Chemicals for form production (repro),
- Printing inks, toners, inks*,

[32] EUROSTAT: PPWD Monitoring, 2016 data on packaging waste generation and recycling by material. https://appsso.eurostat.ec.europa.eu/nui/show. do?dataset=env_waspac&lang=en
[33] www.impactpaperec.eu, visited December 2019
[34] http://www.cepi.org/recyclability_guidelines, visited December 2019

- Varnishes,
- Adhesives,
- Washing agents, including washing agents used for ordinary cleaning of printing machines.
- Dampening solution additives (e.g. alcohol),
- Algicides and
- Foils for foil printing and laminates applicable to printed paper used in the production of printed matter.

Production chemicals used by the printing company must be assessed by Nordic Ecolabelling and must fulfil the requirements in Appendix 1. The requirements are applied regardless of the type of printing method.

In order for a chemical to be assessed by Nordic Ecolabelling **the chemical manufacturer or supplier** must demonstrate compliance with the chemical requirements in Appendix 1.

O10 Chemicals

The printing company must report all **production chemicals** used annually in the production of printed matter, providing documentation regarding the product's tradename, function, supplier and the quantities purchased in kg.

All production chemicals used by the printing company must be assessed by Nordic Ecolabelling and must fulfil the requirements in Appendix 1.

Production chemicals that are purchased separately and added to production chemicals at the printers must also be included.

If a production chemical is used in relation to more than one printing method, the printing company may add up the quantities in the relevant category across the printing methods and on this basis calculate fulfilment of the triviality limits (e.g. adhesives).

Adjustments can be made for chemicals purchased/received during the course of the year, but which has not been used, by uploading stocktake figures at the end of the year for the individual chemical.

*Addressing with ink is exempted from the requirement. For addressing ink, a safety data sheet complying with the standards set out in Annex II of REACH (Regulation 1907/2006/EC) or other technical data sheet must be enclosed.

Trivial limits:

Up to 5% by weight of the quantity of production chemicals in each category purchased during the year can be exempted from the chemical requirements in Appendix 1. For printing inks, adhesives and varnishes an alternative triviality limit of 10 kg per annum and per category applies for which the requirements do not have to be met.

The trivial limits do however not apply to;

- washing agents classified as Aquatic Acute 1 H400, Aquatic Chronic 1-4 H410, H411, H412 or H413.
- printing inks, toners, ink, varnishes and adhesives used in printed matter that will bear the Nordic Ecolabel logo, see requirement O26 and O30.

✉ Complete list of production chemicals, specifying tradename, function, supplier and the quantities purchased in kg.

✉ Enter quantities and upload reports/lists from suppliers detailing trade names and the quantities purchased during the course of the year. Upload calculations to explain any adjustments based on stock counts.

✉ For addressing ink. enclose safety data sheet/product specification must comply with the standards set out in Annex II of REACH (Regulation 1907/2006/EC).

Background to the requirement

The requirement for classification of production chemicals has been updated in relation to CLP and Nordic Ecolabelling´s general chemical requirements. This means that several exemptions and trivial limits for specific chemicals have been removed in generation 6:

- Toluene-based washing agents and printing ink and chemicals containing chrome trioxide and copper sulphate used in gravure printing. This means that it is not possible to use rotogravure printing in the new generation 6;
- Cobalt complex dyes in foils for foil printing and waterless offset;
- UV inks (energy-curable inks) used in inkjet machines. This means that there is limited opportunity to use UV inks in the new generation 6.

The specific requirements and background information for chemicals are described in Appendix 1.

The chemical requirement has been restructured so it is no longer possible to earn points depending on the use of different types of chemicals. The requirement is divided into a general part applicable to all chemicals, a specific part containing requirements as to individual categories of chemicals, and an information section where the supplier must provide information underlying the various points scored under the points system of the criteria document.

Washing agents classified as Aquatic Acute 1 H400, Aquatic Chronic 1-4 H410, H411, H412 or H413, are no longer exempted from the 5% trivial limit, as there are alternatives that are not classified as hazardous to the aquatic environment.

As in generation 5 of the criteria ink used for addressing is exempted from the requirement as the ink may contain problematical substances. Ink for addressing has to meet certain requirements that allows the print to be read on the scanner. Ink used for addressing is typically used on newspapers or envelopes which distributed by address.

Nordic Ecolabelling aims for the health and environmental impacts of chemical products used in Nordic Swan Ecolabelled services and in the manufacture of Nordic Swan Ecolabelled products to be as low as possible. Requirements are therefore set to the classification of chemical products, which is also a general chemicals requirement in several Nordic Swan Ecolabelling criteria. Chemical products classified as carcinogenic, mutagenic, reprotoxic, very toxic, toxic, hazardous for the environment, specific organ toxic and respiratory or skin sensitisation must not be used in Nordic Swan Ecolabelled printing companies and in the manufacture of Nordic Swan Ecolabelled printed matter.

4.8 Emissions to air

The requirement for emissions to air only applies to emissions **of volatile organic compounds (VOC)** at the printing company.

The requirement is based on the consumption of chemicals encompassed by O10 (washing agents, printing inks, alcohol, other dampening solution additives, etc.) depending on the content of VOC and depending on whether there are systems for the collection/destruction of VOC.

If the printing company sells recycled VOC or removes VOC from outgoing air with the aid of, for example, incineration (e.g. heatset) or removes or sells VOC by some other controlled means (e.g. condensation in connection with certain digital printing facilities with wet toner), these quantities may be deducted from the quantities purchased/received.

See Appendix 5 for guidelines and examples on how to calculate emission of VOC.

O11 Consumption of VOC

The printing company's annual **VOC consumption** (kg VOC/tonne purchased substrate) must be less than or equal to the threshold value listed in table 8 below. The permitted VOC consumption varies depending on the **printing method**. If the printing company uses multiple methods of printing, the threshold values is calculated as a weighted value which is defined according to the consumption of substrate in different printing methods.

*Example of calculation of the threshold value using multiple methods of printing. If a printing company is using 500 tons of substrate (sheet fed offset) and 300 tons of substrate (digital printing) the weighted threshold values are calculated as: Calculated threshold value: (500/800) * 7 + (300/800) * 5 = 6.25 kg/ton purchased substrate per year.*

Table 8: Threshold values - VOC consumption (kg/purchased substrate) for different printing methods

Printing method	Threshold value - VOC consumption (Kg/purchased substrate)
Sheet fed offset	7
Digital printing	5
Coldset, newspapers	1
Coldset, forms	3.5
Coldset rotation (except newspaper and form printing)	1.5
Heatset rotation	3
Flexographic printing	1
Envelope production with flexography	1

See the special instructions for calculating VOC emissions for inter alia heatset printing in Appendix 5.

✉ Calculation showing that the requirement is met and reports/lists from the suppliers of substrates stating type/material/quantities purchased during the year.

Background to the requirement

The requirement on consumption of VOC has been adjusted and made more stringent in generation 6 of the criteria. The overall limit for VOC consumption at the printing house have been changed from 9 kg VOC/tonne substrate to new stricter limits depending on the printing methods. The biggest relevance and potential for minimizing the consumption of VOC is within sheet fed offset, heatset, coldset and digital printing.

Usually no production chemicals containing VOC are used in flexographic printing, so the threshold value of 1 kg VOC/substrate is set as an "attention" limit for the development of future chemicals. The strengthening of the requirement is in line with the LCA findings. The proposed threshold values are based on data from Nordic Swan Ecolabelled printing companies.

The calculation of VOC emissions for heatset printing has been adjusted in order to simplify and clarify the VOC calculation.

Printing companies have considerable opportunities to reduce or replace the use of chemicals containing VOC, thereby reducing the environmental impact. VOC emissions can also be reduced by using different technology that either destroys or recycles VOC. Printing companies using wet toner technologies (inkjet or indigo presses), heatset or solvent ink need to implement technology that either destroys or recycles VOC in order to comply with the requirement.

Emissions of volatile organic compounds mainly originate from the use of organic solvents and alcohol in dampening solutions. Heatset inks contain mineral oils which are considered to be VOC when they reach the afterburner. Washing agents and the dampening solution, include isopropyl alcohol (IPA) which contributes by 95% to photochemical ozone formation.

The main source of VOC emissions in the printing house is the pressroom where three main points of VOC emissions are identified as follows:

- Inks: Many of them are solvent based. Their evaporation dries the ink on the substrate. The amount of solvent emitted from the drying ink varies from 5%, in a non-heat-set lithographic process, to 100% in flexographic and heat-set.
- Cleaning: Excess ink in presses has to be removed to ensure the inks do not dry on the rollers and ink wells. Often the chemicals used for cleaning contain high percentages of solvents.
- Fountain solution: This is used in lithographic printing to ensure that oil does not stick to the non-image area of the blanket. Traditionally, isopropyl alcohol is used to control the properties of the fountain solution. The use of IPA makes the fountain solution the primary source of VOC emissions in lithographic facilities.

P6 Consumption of VOC

The printing company may be awarded points depending on the annual VOC consumption (kg VOC/tonne purchased substrate). The threshold values for each printing method are listed in O11.

If the printing company uses multiple methods of printing, the threshold values is calculated as a weighted value which is defined according to the consumption of substrate in different printing methods, see O11.

Calculate points = 1 - (VOC used/threshold value) *100

Example of calculation (sheet fed offset printing company): If the printing company uses 4 kg VOC/purchased substrate, the calculation will be as follows:

*1 - (4/7) *100 = 42% = 4 points*

Table 9: P6 Example of points.

Proportion (%) of VOC consumption in relation to total annual VOC consumption (VOC/tonne purchased substrate)	Points
0 - 9%	0
10 - 24%	2
25 - 49%	4
50 - 74%	6
75 - 99%	8
100% (no use of VOC)	10

✉ The documentation must consist of a calculation in accordance with the option for scoring points outlined above and reports/lists from the suppliers of substrates stating type/material/quantities purchased during the year.

Background to the requirement

The points requirement for consumption of VOC has been adjusted in generation 6 of the criteria. As mentioned earlier, VOC are an important contributor to the environmental impact of the production stage. Hence, introducing points for measures to lower the emission of VOC in the printing company, could reduce the environmental impact.

Consumption of VOC is an area in which printing companies have considerable scope for making a difference and where there is major potential for improvement. Several printers have entirely abandoned the use of alcohol as an additive in dampening solutions, and many printers use washing agents free of VOC. VOC emissions can also be reduced by using BAT technology that either destroys or recycles VOCs. The points requirement rewards printing companies that have low VOC consumption, thereby reducing environmental impact.

Nordic Ecolabelling has collected data and calculated a market average/ spreading of data for the volume of VOC consumption/emission for each printing method, see Appendix 5. The possibility to obtain points is based on the market data as well as the overall weighting of points in the criteria, see O23.

Examples of initiatives to lower the emission of VOC:

- Replacement of production chemicals (washing agents, inks, toner) with a high VOC content with a lower or no VOC content.
- Replacement of old printing machines/technologies with machines/printing technologies which have lowered the total annual VOC consumption (kg VOC/purchased substrate).
- Installation of technology which has lowered the total annual VOC consumption (kg VOC/purchased substrate).

4.9 Energy

The requirement for **energy consumption** includes all the printing company's purchased energy in kWh per **tonne of purchased substrate per year**. The printing company must report purchased fuels for stationary combustion plant and purchased energy in the form of electricity, district heating/cooling etc.

The requirement for energy use is divided in two, part A and part B. All applicants must report the printing company´s total energy use per tonne purchased substrate per year according to part A. If the printing company does not comply with the energy requirement using the **advanced threshold value** in part A, but meets the requirement using the **basic threshold value** in part A, the printing company must comply with the requirement in part B, and thus meet the requirement for energy use.

O12 Energy use

The applicant shall state the printing company´s annual total energy consumption per tonne of purchased substrate.

Part A

The amount of energy consumed at the printing company must be less than or equal to the threshold value for the printing company's total energy use per tonne of purchased substrate. The permitted energy use varies depending on the printing method, and the use of either the advanced- or basic threshold value, see table 10 below. The printing company´s total energy use must be calculated on an annual basis.

Energy consumption is calculated using information in invoices received from suppliers of electricity, fuel and heating to the practising company in relation to purchased substrate on an annual basis.

Printing companies that sell surplus energy, e.g. in the form of district heating, may deduct the quantity sold.

For heating of printing companies in Iceland, geothermal energy is not included in the energy consumed.

If the printing company uses multiple methods of printing, the threshold value is calculated as a weighted value which is defined according to the consumption of substrate in different printing methods. The calculation is done by using only the advanced- or basic threshold values.

Example of calculation of the threshold values using multiple methods of printing. If a printing company is using 500 tons of substrate (sheet fed offset) and 300 tons of substrate (digital printing) the weighted threshold value is calculated as:

*Calculated advanced threshold value: (500/800) * 900 + (300/800) * 2100 = 1350 kWh/ton purchased substrate per year.*

*Calculated basic threshold value: (500/800) * 1500 + (300/800) * 3500 = 2250 kWh/ton purchased substrate per year.*

If the printing company is unable to document their electricity consumption based on direct settlement with an electricity supplier (e.g. an in-house printing company), the printing company shall either;

a) install electricity meters and read off the total annual consumption or

b) use an independent third party to calculate/estimate/verify the printing company’s annual consumption of electricity.

If the printing company is unable to document their heating/cooling use on the basis of direct settlement with a supplier (e.g. an in-house printing plant), and the printing company does not use electricity for heating, the printing company must calculate their total energy consumption by calculating heat consumption on the basis of the heat consumption of the building and adding this to electricity consumption. The printing company's proportion of the total heat consumption of the building is calculated based on the floor space of the printing company relative to the heated area in the building.

Any floor space that is to be excluded from this calculation must be approved in advance by Nordic Ecolabelling.

Example of calculation of heat consumption for an in-house printing company: If the printing company has a floor space of 2 000 m^2 and is located in a 50 000 m^2 building with a total heat consumption of 500 000 kWh per year, the heat consumption of the printer will be 500 000*2 000/50 000 =20 000 kWh per year.

Table 10: Threshold values - average energy consumption (kWh/purchased substrate) for different printing methods

Printing method	Threshold value - Average energy consumption (kWh/purchased substrate)
Sheet fed offset	Advanced: 900 Basic: 1500
Digital printing	Advanced: 2100 Basic: 3500
Coldset, newspapers	Advanced: 350 Basic: 650
Coldset, forms	Advanced: 700 Basic: 1200
Coldset rotation (except newspaper)	Advanced: 500 Basic: 850
Heatset rotation	Advanced: 600 Basic:1000
Flexographic printing (except envelope production)	Advanced: 200 Basic: 350
Envelope production with flexography	Advanced: 500 Basic: 800

The energy content of various fuels and district heating is specified in Appendix X.

Part B

The printing company must comply with a minimum of the following activities:

- Certified according to ISO 50001.
- Has undergone an energy screening according to EN 16247-1 within the last 3 years. The energy screening/analysis is to contain proposals for measures that include potential savings and costs. The printing company must have a written policy containing goals and action plans for complying with the energy requirement, part A, using the advanced threshold value, during the period of validity of the licence.
- Has undergone an energy screening within the last 3 years conducted by an independent third party focusing on potential energy savings within the areas of e.g. lighting, compressed air, ventilation or space heating. The printing company must have a written policy containing goals and action plans for complying with the energy requirement, part A, using the advanced threshold value, during the period of validity of the licence.
- Certified according to a system that sets requirement for the company's annual energy use such as ClimateCalc[35]. The printing company must have a written policy containing goals and action plans for complying with the energy requirement, part A, using the advanced threshold value, during the period of validity of the licence.

Companies using part B (energy screening according to EN 16247-1, limited energy screening or ClimateCalc) is subjected to the requirement; O22 annual follow-up of licence.

[35] https://eu.climatecalc.eu/ (visited 7/6-2019)

✉ Part A: Calculation and documentation (invoices from suppliers of electricity, fuel and heating) showing compliance with the requirement.

✉ Part A: In case of no individual energy measurement (e.g. an in-house printing plant): Calculation and documentation from an independent third party verifying the printing companies' annual consumption of electricity.

✉ Part B:

- Valid ISO 50001 certificate or
- Copy of the energy screening report conducted by an independent third party according to EN 16247-1 (not older than 3 years). Written policy containing goals and action plans for complying with the energy requirement, part A, using the advanced threshold value, during the period of validity of the licence or
- Copy of the light-energy screening report conducted by an independent third party (not older than 3 years). Written policy containing goals and action plans for complying with the energy requirement, part A, using the advanced threshold value, during the period of validity of the licence.
- Valid certificate such as Climate Calc certificate. Written policy containing goals and action plans for complying with the energy requirement, part A, using the advanced threshold value, during the period of validity of the licence.

Background to the reequirment

The requirement on energy use has been adjusted and amended in generation 6 of the criteria. Next to production of substrates energy use at the printing company, together with chemicals used during the production phase, are the most important contributors to the environmental impact of production stage, see section 3.

The requirement on energy use covers all the printing company's purchased energy in kWh per tonne of purchased substrate per year. Unlike generation 5 of the criteria, the requirement does not include energy consumption by external finishers (book binders).

In generation 5, the threshold for energy use was set at 5000, 4000 and 3500 kWh/tonne of product respectively for digital printing, sheet fed offset and all the remaining printing technologies. In generation 6, a new threshold for energy use has been set for each of the printing methods, primarily based on data from licence holders (around 350 printing companies). The requirement for energy use has also been amended from one threshold value to two threshold values for each printing method. The reason for this is a desire both to set an absolute threshold value for energy use and to address energy efficiency by supporting/recognizing printing companies working with **Energy Management Systems** (EnMS).

The result of a major European project[36] on energy efficiency in the printing industry shows that there is great potential for energy savings at the printing companies especially within the areas of e.g. lighting, compressed air, ventilation or space heating.

[36] Energy Management Standardization in printing industry (EMSPI) conducted in 2014-2017. https://www.emspi.eu/index.html, visited May 2019.

Certified energy management and audits according to ISO 50001 or EN 16247-1 are costly and therefore not a viable option for small printing companies in particular. It is possible for printing companies to conduct limited energy screening by an independent third party focusing on potential energy savings within the areas of e.g. lighting, compressed air, ventilation or space heating. Printing companies that have undergone an energy screening must have a written policy. The written policy must contain goals and action plans for complying with the energy requirement, part A, using the advanced threshold value.

Printing companies that has undergone an energy screening according to EN 16247-1 within the last 3 years, or is certified according to ClimateCalc, must likewise have a written policy. The written policy must contain goals and action plans for complying with the energy requirement, part A, using the advanced threshold value.

ClimateCalc is a tool for calculating the carbon footprint of both the printing company and a specific print job. As part of the calculation of the carbon footprint, the printing company annually must document its energy use as:

- purchased fuel for burning in the company's own stationary burning units;
- purchased electricity for use in the company and
- purchased district heating.

In this way, ClimateCalc acts as an energy management system with annual 3rd party audit.

Printing companies that have either; a) undergone an energy screening according to EN 16247-1 b) certified according to ClimteCalc or c) conduct a limited energy screening, must follow up on their goals and action plans annually, see O22.

4.10 Plastic packaging

O13 Plastic packaging

Plastic packaging must not contain PVC.

By plastic packaging is meant packaging that is used for protection and collation of individual/units of printed matter during storage, transport and distribution.

✉ Declaration from the printing company that the requirement is met. Appendix 4 may be used.

Background to the requirement

The requirement is unchanged compared to generation 5 of the criteria. The requirement applies to plastic packaging used for protection and collation of individual/units of printed matter during storage, transport and distribution.

Lamination e.g. adhering a layer of plastic (polyethylene, polymerized acrylics, vinyls, styrenes, among others) to a paper is not part of this requirement. Requirements for lamination/film lamination are subjected to the chemical requirement (O10).

PVC is sometimes used in plastic packaging. PVC and other halogenated plastics are excluded from Nordic Swan Ecolabelled products since they lead to adverse environmental impacts in waste handling and contain substances with adverse health effects. Information on PVC see O6.

4.11 Waste

The requirement for waste applies to the printing company. The requirement consists of a mandatory requirement for a waste management system and the possibilities for the printing company to be awarded points depending on amount of waste paper and waste sorting.

O14 Waste management system

The printing company shall have in place a system for handling waste which addresses and documents the measures taken to reduce the amount of solid and liquid waste, including waste paper, waste from substrates other than paper, ink waste, cleaning agent solution and dampening solution waste as defined by local or national regulatory authorities.

The system shall be documented and shall include information on at least the following procedures:

- handling, collection, separation and use of recyclable materials from the waste stream;
- handling, collection, separation and disposal of hazardous waste, as defined by the relevant local and national regulatory authorities.
- how the individual fractions are handled (internal or external reuse, recycling, energy use, landfilling or other).

✉ The printing company shall provide a waste minimization and management plan. If the printer is environmentally certified (ISO 14001, EMAS) or has an environmental licence from the authorities, it will be sufficient for the waste plan to be uploaded from the system together with the environmental management certificate/environmental licence.

✉ Documentation of waste disposal, e.g. invoices or an annual statement from the waste disposal operator.

Background to the requirement

The requirement on waste management system remains the same as in the previous version. The requirement both aims to reduce the amount of waste generated during production of printed matter and increase attention paid to the waste fractions.

A waste management system is a valuable tool that ensures control over the material flow, and drives to waste prevention, and preparing for reuse, recovery, recycling, and safe disposal. One of the limiting factors to implementing a comprehensive waste management strategy is the availability of possible routes for waste treatment either internally or externally. This especially applies to substrates other than paper such as plastic, textiles and composites. Although it is possible to achieve a zero waste to landfill target, this requires access to end markets which should be developed over time and will vary depending on local infrastructure and demand. Therefore, no specific waste treatment routes are required under the revised criterion proposal.

The revised criterion requires applicants to develop a comprehensive waste minimization and management plan that addresses all type of waste generated at the printing company. This will serve to further increase awareness of the quantities of waste that are formed and can be used as documentation of some of the measures for which points are awarded in the area of waste.

P7 Waste paper

The printing company may be awarded up to 10 points depending on the quantity of waste paper. The threshold values for each individual printing method are listed in table 11 below.

Calculate the waste paper percentage for the printing method based on the weight specified on the invoice from the recipient of waste paper, or by weighing the waste paper at the printing company in relation to paper consumption on an annual basis. Waste paper generated in connection with external finishing must also be included in the calculation.

Waste paper from external finishing covers waste paper from finishers encompassed by O3 as well as wastepaper from finishers that only perform mechanical finishing treatment.

If all finishing is performed externally, the wastepaper of the printing company must be multiplied by 2 in order to produce a figure for total waste paper, unless the printer can show that some other figure applies for waste paper generated by external bookbinders.

If the printing company uses multiple methods of printing the threshold values is calculated as a weighted value which is defined according to quantity of waste paper.

*Example of calculation of the threshold value using multiple methods of printing. If a printing company is using 500 tons of substrate (sheet fed offset) and 300 tons of substrate (digital printing) the weighted threshold value is calculated as: Calculated threshold value: (500/800) * 23 + (300/800) * 20 = 21.9 %.*

Table 11: Threshold values - Average waste paper %

Printing method	Threshold value - wastepaper (%)
Sheet fed offset	23
Digital printing	20
Coldset, newspapers	10
Coldset, forms	18
Coldset rotation (except newspaper and form printing)	19
Heatset rotation	21
Flexographic printing	11
Envelope production with flexography	15

Calculate points = 1 - (quantity of waste paper / threshold value) * 100

Example of point calculation (sheet fed offset printing company): If the printing company´s quantity of waste paper is calculated at 18%, the calculation will be as follows:

*1 - (18/23) *100 = 22 % = 6 points*

Table 12: P7 example of points

Proportion of wastepaper (%) in relation to threshold value for wastepaper (%)	Points
0	0
1 - 10%	2
11 - 20%	4
21 - 40%	6
41- 60%	8
61 - 100%	10

✉ The printing company shall provide a description of the calculation in accordance with the option for scoring points outlined above as well as an annual specification or the like from the recipient documenting the quantity of wastepaper disposed of, or details of how the wastepaper was weighed.

✉ A copy of invoices or annual report from the recipient documenting the quantity of wastepaper disposed, or details on how the wastepaper was weighed.

Background to the requirement

The requirement for wastepaper has been adjusted and amended in generation 6 of the criteria. As mentioned earlier the main impact of a printed product is sourced back to the paper production process. Finding ways to reduce paper waste can therefore present opportunities for printers wanting to become more efficient, engage in more sustainable production and lower costs.

Nordic Ecolabelling demands that wastepaper is calculated based on weight. The printer must either weigh the wastepaper itself or obtain information about weight from those who collect the wastepaper.

Nordic Ecolabelling has observed up to 30-40% wastepaper at both offset printers and digital printers. Since paper accounts for a major part of the cost of producing an item of printed matter, it is of major significance to both the environment and the economy. The difference in values is one of the reasons why Nordic Ecolabelling operates with different points for different printing methods. This gives an incentive to make improvements for each printing method.

The threshold values for the different printing methods are based on average wastepaper-data from license holders and related ecolabelling schemes such as the EU Ecolabel[37] and Blue Angel[38]. Compared to generation 5 of the criteria the reference value for digital printing has been changed from an average of 10% to 20% and reflects the evolution within new digital printing technologies. E.g. in the past, digital printing was primarily made up of photocopies and simple printers. Today, new digital technologies have replaced traditional offset printing with accompanying higher share of wastepaper. The average reference value for the other printing methods is the same as in generation 5. The requirement for point scoring has, however, been amended in generation 6. Now it is only possible to score points if the printing companies' proportion of wastepaper is below the different threshold values.

As in generation 5, wastepaper generated in connection with external finishing must also be included in the calculation.

[37] https://ec.europa.eu/environment/ecolabel/products-groups-and-criteria.html, visited August 2019
[38] Basic Criteria for Award of the Environmental Label for Printed matter (RAL-UZ 195) of Blue Angel. January 2015

If the printing company uses multiple methods of printing the threshold values is calculated as a weighted value which is defined according to quantity of wastepaper.

P8 Unsorted waste

The printing company may be awarded up to 5 points depending on the quantity of mixed waste in kg per tonne substrate (unsorted/unsuitable for recycling solid waste that is incinerated or goes to a land fill).

If household waste can be separated, it can be excluded from the calculation.

Table 13: P8 example of points

Mixed waste (kg/tonne purchased substrates)	Points
0	5
1 - 5	4
6 - 10	3
11 - 15	2
16 - 20	1
Above 20	0

✉ The printing company shall provide a description of the calculation in accordance with the option for scoring points outlined above as well as an annual specification or the like from the recipient documenting the quantity of mixed waste (kg).

Background to the requirement

The requirement is unchanged compared to generation 5 of the criteria. The requirement underlines the importance of the waste hierarchy in supporting the transition to the circular economy, starting with an increase in prevention, preparation for reuse and recycling of waste, and minimizing waste disposal in particular through reduction of landfilled waste.

Data from Nordic Ecolabelled licensees shows a considerable variation between the printing company's proportion of unsorted waste. Printing companies that print on materials other than paper tend to have a higher proportion of unsorted waste than printing companies that print on paper. Composite substrates, e.g. substrates that contain a minimum of two or several different types of materials are typically disposed of for incineration or land fill. Mesh or digital printing films are often coated with soft PVC or vinyl. Currently, soft PVC materials cannot be disposed of for recycling[39] and therefore end up as mixed waste/unsuitable for recycling. Substrates coated with foils or films or different kinds of packaging also ends up as mixed waste.

The printing company has the possibility (in dialogue with customers) to choose substrates which can be recycled in today's waste recycling systems, thereby lowering the proportion of mixed waste.

[39] Anna Fråne ett al.: PVC waste treatment in the Nordic countries, Nordic Council of Ministers 2019.

4.12 Ecolabelled products and services

The requirement awards the printing company's purchase of ecolabelled products and services This requirement has been included in order to increase awareness of green purchasing policies.

P9 Purchase of ecolabelled products and services

The printing company may be awarded up to 2 points depending on the annual use of ecolabelled products and services. The products or services are listed in table 14 below:

Table 14: P9 example of possible points

Ecolabelled products or services	Points
100% by weight of used rags or 90% by weight of used work clothes is cleaned/laundered at a Nordic Swan Ecolabelled textile services	1
At least 90% by weight of the work clothes used in production are Nordic Swan Ecolabelled or EU ecolabelled	1
100% use of Nordic Swan Ecolabelled cleaning Services	1
At least 100% by weight of industrial tissue paper used in the printing process (does not include for example hand drying in toilets and the like) is Nordic Swan- or EU ecolabelled	1

✉ The printing company shall provide a description of the calculation in accordance with the option for scoring points outlined above.

Background to the requirement

The requirement on use of ecolabelled products and services has been adjusted and amended in generation 6 of the criteria. It is only possible to obtain points for use of products or services relevant to the production of printed matter, thus contributing to reducing the environmental impact of the life cycle of printed matter.

From the 6th generation of the criteria, it is possible to obtain 1 point if 100% of the cleaning carried out at the printing company is performed by Nordic Swan Ecolabelled cleaning services.

The limit of at least 90% by weight of used rags/clothes laundered at Nordic Swan Ecolabelled textile services and use of ecolabelled industrial tissue paper has been amended from 90% to 100% in generation 6 of the criteria. The amendment of the requirement is based on data from licensees and dialogue with the industry. The limit of at least 90% used working clothes remains unchanged.

4.13 Use of Nordic Swan logo on printed matter

The requirement awards the printing company's use of the Nordic Swan logo on printed matter. This requirement has been included in order to increase the awareness at the printing company, and among the printing industry's customers, to use the log on printed matter.

P10 Use of Nordic Swan logo on printed matter

The printing company may be awarded up to 5 points depending on the annual number of **orders produced** using the Nordic Swan logo on printed matter:

*Example: If the printing company manufactures 150 production orders a year and 12 of the production orders are Nordic Swan Ecolabelled printed matter, the printing company is awarded: (12/150) * 100 =8% = 2 points.*

Table 15: P10 Example of points

Annual number of manufactured Nordic Ecolabelled orders in relation to the total number of orders produced (which can be labelled).	Points
0 - 4%	0
5 - 10%	1
11 - 15%	2
16 - 25%	3
26 - 49%	4
Above 50%	5

✉ The printing company shall provide a description of the calculation in accordance with the option for scoring points outlined above as well as an annual specification of orders produced.

Background to the requirement

This is a new requirement in generation 6 of the criteria. The requirement supports the printing companies' ability to use the Nordic Swan logo to a greater extent than they do today. The requirement shall be calculated based on the annual number of orders produced and which can be labelled, e.g. printed on paper, textile and construction/facade panels. A production order is defined as an order issued within a company to produce a specific quantity of material within a certain timeframe.

5 Environmental management and regulatory requirements

To ensure that the Nordic Ecolabelling requirements are met, a documented management system must be in place, and it must include the following implemented procedures.

If printing company has a quality system that is certified to ISO 9001, or an environmental management system certified under ISO 14 001 or EMAS, and the following procedures are applied, it is sufficient for the certification body's auditor to certify compliance with the requirements.

O15 Organisation and responsibility

An organizational chart shall be drawn up. Responsibility and authority for central environmental functions shall be defined. Responsibility for the Nordic Swan Ecolabel licence, marketing, training and purchasing shall be specified, and the contact person for Nordic Ecolabelling named.

✉ Copy of organizational chart.

O16 Documentation

The licensee must archive the documentation that is sent in with the application, or in a similar way maintain information in the Nordic Ecolabelling data system, as long as the Nordic Swan Ecolabel licence remains valid. All the documents regarding the licence must be easily available at the premises of the licensee. This includes documents on internal checks and measurement reports, for example. The contact person for communication with Nordic Ecolabelling is responsible for ensuring that the documentation is updated and available.

🔑 This is checked on site as necessary.

O17 Procedures in the event of changes, self-assessment and non-conformities

The printing company must ensure via procedures or instructions that:

- In the event of planned changes that affect the requirements of the Nordic Swan Ecolabel, the contact person must notify Nordic Ecolabelling before the changes are implemented. This may relate, for example, to a change of chemicals or printing technologies. The printing company may only use chemicals assessed by Nordic Ecolabelling.
- In the event of unforeseen non-conformities that affect how the ecolabelling requirements are fulfilled, the contact person must immediately notify Nordic Ecolabelling in writing.
- There is a system for handling claims and complaints

✉ Copy of procedures in the event of planned changes, self-assessment, unforeseen non-conformities and claims.

O18 Training

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

Employees must receive regular training in general environmental matters and environmental issues specific to their field of work that have a bearing on the fulfilling of Nordic Ecolabelling requirements.

Participation in training shall be documented. Subcontractors participating in the daily business shall participate in the printing companies training or certify that they have received equivalent training.

🔑 Lists of participants after completion of training.

O19 Customer information

Customers must be informed that they are using a Nordic Swan Ecolabelled printing company and what this means.

✉ Copy of the customer information procedure.

O20 Legislation and regulations

The business must ensure compliance with the applicable legislation regarding the working environment, the external environment, finances, hygiene and health. The business must not have any form of negative criticism from an authority or agency which has not been rectified within the deadline set by the supervisory authority or agency. If this requirement is not met, Nordic Ecolabelling may revoke the licence.

✉ Duly signed application form.

O21 Strategic goals to reduce environmental impact

The printing company shall have procedures showing how it works with strategic goals to reduce environmental impact in the production of printed matter such as; mapping energy efficiency measures, focus on production chemicals (content of VOC, reduction of VOC), design of printed matter in order to minimize waste or dialogue with suppliers regarding use/selection of substrates with low environmental impact.

The goals shall be quantitative and time-based, and they shall be determined by the management. The strategic goals must be assessed at least once a year by management.

✉ Enclose procedures for policy or equivalent documentation of the manufacturer's work with environmental goals, showing fulfilment of the requirement. Minutes from the management's annual assessment on complying with strategic goals.

Background to the requirement

This is a new requirement in generation 6 of the criteria. It is required that the printing company has routines for working continuously with strategic goals to reduce environmental impact in its production of printed matter. There are many definitions of sustainability. For example, the UN's sustainable development goals[40] encompass a broad spectrum of environmental goals such as clean energy and climate action as well as goals for economic growth, hunger, poverty, health, education, equality, peace, and justice.

The requirement supports the printing company´s work with strategic goals that may also lie outside the Nordic Ecolabel requirements, such as many of the UN sustainable development goals. This may, for example, take the form of mapping energy efficiency measures, or dialogue with subcontractors to reduce environmental impact in raw material production, or the design in the final product.

The printing company must develop its own strategic goals to reduce environmental impact in its production of printed matter. However, the goals must be quantitative and time-based, and they shall be determined by the management. Annually, the printing company (the management) has to follow up on its strategic goals to reduce environmental impact in requirement O22. It is not an absolute requirement for the printing company to meet its goals, but the requirement ensures that the company management has to assess its strategic goals on an annual basis at least. This way, the concrete environmental work in the company can be documented and thereby lead to real environmental gains.

O22 Follow-up of licence

The printing company shall ensure that the requirements of the criteria are met during the validity period of the licence. At least once a year (within 6 months of closing the books) a review of operations shall be made on at least the following areas:

- Substrates, requirements O4, O5, O6, O7 and O8.
- Chemicals, requirement O10.
- VOC, requirements O11.
- Follow up on strategic goals to;
  a) complying with the energy requirement O12 (if using part B; energy screening according to EN 16247-1, limited energy screening or ClimateCalc);
  b) reduce environmental impact O21.

Nordic Ecolabelling may request reports from the internal review and examine a selection, or all, of the requirements. Information on a compliance check is given in advance.

✉ Routine for monitoring licence.

Background to the requirement

The requirement has been adjusted to the new structure. As in generation 5, the printing company has to review its operations and overall compliance with the criteria every year.

[40] https://www.un.org/sustainabledevelopment/sustainable-development-goals/, visited November 2019

The review must focus on the requirements which have a huge impact on the fulfilment of requirements: Requirements for the annual use of substrates and chemicals, including consumption of VOC.

Nordic Ecolabelling would like to help the printing companies in both working on and focusing on their strategic goals to reduce environmental impact in the production of printed matter, requirement O21. By doing so, printing companies are obliged to evaluate their goals at least once a year and hopefully meet the objectives. The printing companies must set specific quantitative and time-based goals for themselves. Nordic Ecolabelling thus has no requirements for the strategic goals or whether the printing company fulfils its own goals.

If the printing company is working with energy management, part B in O12, they are obliged to evaluate their goals and action plans for complying with the energy requirement, part A.

Nordic Ecolabelling may request reports from the internal review and examine a selection, or all, of the requirements. Information on a compliance check is given in advance.

6 Summary of points

O23 Obligatory requirement points scored

The printing company must score at least 19 points.

The table below summarises the point score requirements and how many points can be earned for each requirement.

Table 16: Points total

Point score requirements	Points achieved	Maximum number of points
P1 Printing substrates		5
P2 Controlled and Ecolabelled paper		8
P3 Content of recycled material		5
P4 Mono substrates		5
P5 Recycled material and mono substrates		10
P6 VOC		10
P7 Wastepaper		10
P8 Unsorted waste		5
P9 Ecolabelled products and services		2
P10 Use of the Nordic Swan Ecolabel logo on printed matter		5
Total		65

✉ Summary of points in line with the table above.

Background to the requirement

To ensure the greatest possible potential for product development and innovation and thus usability of the criteria, combined with a low environmental impact overall, a points system has been created. This means that if a printing company is ahead in one area, it can perform less well in other areas as long as the printing company has a low environmental impact overall.

On top of the obligatory requirements, the printing company must score at least a total of 19 points in the point score requirements. This can be attained through a high share of controlled/ecolabelled paper, -mono-substrates/substrates containing recycled material, reduced emission of VOC, material efficiency and use of the Nordic Swan logo on printed matter – or by putting initiatives in place in other areas as set out above.

The maximum number of points in each point score requirement (P1-P10) is weighted from the LCA findings in section 3. Manufacturing of paper is the main environmental and resource-related burden in the life cycle of printed matter. Therefore, the mandatory requirement O5 for consumption of inspected and ecolabelled paper has been stringent from 25 % to 70%. Additional consumption of inspected and ecolabelled paper (P2) is weighted a factor 2 or up to 8 points. Paper waste- and VOC minimization and use of mono substrates containing recycled material is weighted a factor 2 or up to 10 points. Use of paper substrates, mono substrates or substrates containing recycled material, minimization of unsorted waste and production of Nordic Swan Ecolabelled printed matter is weighted 1 or up to 5 points. Finally, use of other ecolabelled products or services can receive up to 2 points.

The total points requirement is an important requirement as it is a requirement that most clearly distinguishes printing companies on the market with the best environmental performance from the rest. Nordic Ecolabelling judges that there is great potential for improvement as there is a very wide spread of environmental performance and as the industry is developing rapidly towards new digital printing techniques and printing substrates.

7 Special requirements concerning the use of The Nordic Swan Ecolabel logo on printed matter

The following requirements apply to printed matter that will bear the ecolabel. Inserts in magazines and daily papers, for example, need only meet the requirements if the Nordic Swan Ecolabel logo also appears on the insert

O24 Paper

A minimum of 90% of the total weight of the Nordic Swan Ecolabelled printed matter must consist of inspected or Nordic Swan Ecolabelled paper.

In the case of stationery and office supplies such as books, folders, ring binders, notepads and forms, the requirement is 80%.

The non-paper product parts of stationary paper product such as metal bars or plastic covers shall be easily removable to ensure that those components will not hinder the recycling process.

Inserts that are fixed are considered part of the printed matter.

✉ Upload a copy of the duly completed and signed Appendix 4.

O25 Textile and panels

A minimum of 90% of the total weight of the Nordic Swan Ecolabelled printed matter must consist of Nordic Swan- or EU-Ecolabelled textiles or Nordic Swan Ecolabelled construction and facade panels.

If case of printing on Nordic Swan Ecolabelled acoustic panels, or if the acoustic panels is used as a basis for a printed textile matter, the printing must not have a negative effect on the primary function of absorbing sound waves.

In case of roll-up stands, printed canvas on a wooden frame and other similar products, only the material carrying the information is regarded as printed matter.

✉ Upload a copy of the duly completed and signed Appendix 4, see O24.

O26 Printing inks, toners, inks, varnishes and adhesives

All printing inks, toners, inks, varnishes and adhesives used in the Nordic Swan Ecolabelled printed matter must be assessed by Nordic Ecolabelling and must fulfil the requirements in Appendix 1.

The printing company must ensure that any printing inks, toners, inks, varnishes and adhesives which are exempt from requirement O10 are not used in the Nordic Swan Ecolabelled printed matter.

✉ Upload a copy of the duly completed and signed Appendix 4, see O24.

O27 Lamination and PVC

Nordic Swan Ecolabelled printed matter must not contain PVC.

Lamination shall only be used to increase the durability of products with a life span of at least 1 year, for example, books, binders, folders, exercise books, calendars, notebooks and diaries.

Lamination shall not be used in magazines.

Double lamination shall not be used in any product.

✉ Upload a copy of the duly completed and signed Appendix 4, see O24.

O28 Fragrance

Fragrance/scent must not be added to Nordic Swan Ecolabelled printed matter (e.g. scented varnish). Packaged product samples with fragrance, attached to an item of printed matter, or removable scratch samples, are not encompassed by this.

✉ Upload a copy of the duly completed and signed Appendix 4, see O24.

O29 Printing suppliers and finishers (book binders)

All printer suppliers used in the production of printed matter that is to bear the Nordic Swan Ecolabel must be licensed to use the Nordic Swan Ecolabel. All external finishers encompassed by O3 must have been inspected.

✉ Upload a copy of the duly completed and signed Appendix 4, see O24.

O30 Traceability

If only part of the output of the printing company is Nordic Swan Ecolabelled, orders bearing the Nordic Swan Ecolabel must be marked clearly to enable them to be separated from other orders. Information must also be displayed disclosing:

- name of paper and paper grades, textile or panels;
- names on printing inks, toners, inks, varnishes or adhesives;
- subcontractors used;
- how the Nordic Swan Ecolabel logo is reproduced on the items of printed matter (e.g. with the aid of order notes or order bags).

✉ Upload a copy of the duly completed and signed Appendix 4, see O24.

Background to requirements applicable to ecolabelled products

The printing company must fulfil special requirements applicable to Nordic Swan Ecolabelled printed matter. These requirements have been selected from a credibility perspective and based on the expectations that the reader/user has of Nordic Swan Ecolabelled printed matter.

The requirements applicable to ecolabelled products have been adjusted in generation 6 of the criteria and the opportunity of using the logo on Nordic Swan or EU Ecolabelled textiles or Nordic Swan Ecolabelled construction and facade panels has been added. As is the case for paper, a minimum of 90% of the total weight of the Nordic Swan Ecolabelled printed matter must consist of Nordic Swan or EU-Ecolabelled textiles or Nordic Swan Ecolabelled construction and facade panels. Both printing on textiles for advertising and print directly on boards made from wood, for example, are typically used as point of sale (POS) material. In the case of roll-up stands, printed canvas on a wooden frame and other similar products, only the material carrying the information is regarded as printed matter. Other parts such as the metal stand or wooden frame are not covered by the requirements in the criteria. Other parts such as the metal stand or wooden frame are not covered by requirements in the criteria. However, the Nordic Swan Ecolabel logo must as a general rule not be placed on the metal stand or wooden frame since confusion may arise about what the Nordic Swan Ecolabel applies to.

The requirements applicable to ecolabelled products have been amended in several ways to ensure that the products do not hinder the recycling process of the labelled printed matter, and contain chemicals which are harmful to the environment and human health:

- Any non-paper product parts of stationary paper product such as metal bars/clips or plastic covers shall be easily removable to ensure that those components do not hinder the recycling process.
- Lamination shall only be used to increase the durability of products with a life span of at least 1 year, for example, books, binders, folders, exercise books, calendars, notebooks and diaries. Lamination shall not be used in magazines. Double lamination shall not be used in any product.
- All printing inks, toners, inks, varnishes and adhesives must be assessed by Nordic Ecolabelling and must fulfil the requirements in Appendix 1.

As in generation 5, Nordic Swan Ecolabelled printed matter must not contain PVC or fragrance.

8 Areas without requirements

The following is a brief justification for why Nordic Ecolabelling has chosen not to include requirements within specific areas below in this criteria generation.

Water consumption during printing.

9 Changes compared to previous generation

The table below lists changes compared with the previous generation of the criteria.

Table 17: Overview of changes to criteria for Printing Companies and Printed Matter generation 6 compared with previous generation 5.

Proposed requirement generation 6	Requirement generation 6	Same requirement	Change	New requirement	Comment
Definition of the product group	Definition of the product group		*		Clarification of definition. No use of; film (repro) and 3D printing. Packaging has to made of paper (wood pulp).
O1	Type of printing company		*		The 50% turnover can also originate form ecolabelled textile and panels.
O2	Suppliers of printing services		*		The requirement has been stringent from 75% to 95% by weight.
O3	Chemical finishing services		*		The requirement has been stringent from 90% to 95%. New requirement to washing agents.
O4	Printing substrates		*		Information and calculation of total number of tonnes substrate purchased annually.
P1	Printing substrates			*	Points for total share of print on paper.
O5	Inspected and Ecolabelled paper		*		The requirement has been stringent from 25% to 70%.
P2	Inspected and Ecolabelled paper		*		New scale for points - up to 8 points.
O6	Other substrates than paper			*	New requirement for chemical products used in the finishing of the substrate.
O7	Textiles			*	New requirement: At least 50% ecolabelled textiles.
O8	Panels/boards made of wood			*	New requirement; At least 50% ecolabelled or FSC/PEFC certified panels/boards.
P3	Content of recycled materials			*	Points for substrates other than paper containing recycled material.
P4	Mono substrates			*	Points for mono substrates - substrates other than paper
P5	Recycled material and mono substrates			*	Points for mono substrates containing recycled material.

O9	Paper based packaging			*	Design for recycling. No use of PVC/halogenated plastic/tape, was or latex coating.
O10	Chemicals		*		New structure - updated in relation to CLP and Nordic Ecolabellings general requirements. New requirement to recyclability.
O11	Consumption of VOC		*		The requirement has been stringent from 9 kg purchased annually to <7 kg.
P6	Consumption of VOC		*		New scale for points - up to 10 points.
O12	Energy use		*		New structure - stringent of threshold values and acceptance of certified energy management.
O13	Plastic packaging	*			No use of PVC.
O14	Waste management system	*			Requirement for waste management system.
P7	Waste paper		*		New scale for points - up to 10 points.
P8	Unsorted waste		*		New scale for points - up to 5 points.
P9	Purchase of ecolabelled products and services		*		New scale for points - up to 2 points.
P10	Use of Swan logo on printed matter			*	Points for Nordic Swan Ecolabelled printed matter.
O15	Organisation and responsibility	*			
O16	Documentation	*			
O17	Changes and non-conformities	*			
O18	Training	*			
O19	Customer information	*			
O20	Legislation and regulations	*			
O21	Strategic goals and reduced environmental impact			*	Procedure for working with strategic goals and reduced environmental impact - quantitative and time-based goals.
O22	Follow-up of licence			*	Annual review on consumption of substrates and chemicals.
O23	Obligatory requirement points scored		*		New scale for points - Minimum 19 points.
Special requirements concerning the placement of The Nordic Swan Ecolabel logo on the printed matter					
O24	Paper	*			
O25	Textile and panels			*	Use of Ecolabelled textile and panels.

O26	Printing inks, toners, ink, vanishes and adhesives			*	All chemicals must be assessed by Nordic Ecolabelling.
O27	Lamination and PVC		*		No PVC and requirements for use of lamination.
O28	Fragrance	*			No Fragrance.
O29	Printing suppliers and finishers	*			
O30	Traceability		*		Traceability on printing inks, toners, inks, varnishes and adhesives used.

Criteria version history

Nordic Ecolabelling adopted version X.X of the criteria for XX on DAY MONTH YEAR. The criteria are valid until DAY MONTH YEAR.

New criteria

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

- Product definition - new types of printing technologies and types of printed matter such as packaging.
- Printing substrates - further analysis of the environmental impact of substrates other than paper.
- Energy use - energy savings at the printing company.
- Use of chemicals
- Recyclability of the printed matter