About Nordic Swan Ecolabelled

Paper Products – Basic and Chemical Modules

Version 3.0 • 05 October 2020 – 31 December 2025

Background document

Nordic Ecolabelling

Content

AI001 Paper products – Basic and Chemical Modules, Version 3.0, 05 October 2020

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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The Nordic Ecolabelling Modular System for Paper Products

Nordic Swan Ecolabelled paper products may be made of cellulosic fibres from wood, plants and/or recycled fibre. The criteria for Nordic Ecolabelling of paper products encompass a wide range of requirements, most of which relate to pulp and paper production. Since the raw materials, chemicals and manufacturing processes in pulp and paper production are similar, Nordic Ecolabelling has introduced a so-called modular system for paper products.

The Basic Module contains general requirements concerning forestry management, emissions, energy use and waste disposal regarding pulp and paper production.

The Chemical Module contains general requirements regarding the use of chemicals in the manufacture of pulp and paper.

Supplementary Modules contain those requirements, regarding specific paper products, which must be fulfilled in order to grant a licence for the products to carry the Nordic Swan Ecolabel. The requirements' levels in a Supplementary Module may be more stringent or more lenient than those of the Basic or Chemical Module. If the requirements in the modules differ, the requirement levels specified in the applicable Supplementary Module are to be applied. For a product to be granted a licence to carry the Nordic Swan Ecolabel, the relevant requirements in the Basic Module and Chemical Module, in addition to the requirements in the applicable Supplementary Module, must be fulfilled.

Version 3 of the modular system includes the following documents:

- Paper Products – Basic Module
- Paper Products – Chemical Module

And the following Supplementary Modules:

- Copy and Printing Paper
- Grease-Proof Paper
- Tissue Paper

Other Nordic Swan Ecolabel criteria may refer to the modular system, such as the criteria for Disposables for Food and the criteria for Sanitary Products.

This background for Basic and Chemical Modules presents new and revised requirements, and explains the background to the requirements, and any changes compared with previous generation 2 of the Basic Module and Chemical Module. Many of the arguments for the changes are also pertinent to issues arising from the revision of the Supplementary Module for Copy and Printing Paper, from version 4 to version 5. This background description may also be useful for future revisions of Nordic Ecolabelling's Criteria for Tissue Paper and other paper-related products.

In chapter 2, justification of the requirements in the Basic Module is presented. Requirement O8 in the Basic Module is applied to chemicals and therefore, justification of requirements in the Chemical Module is presented jointly in Appendix 2 in this background document.

1 Environmental impact of paper products

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. For paper- / board-based products, primarily four areas are of greatest significance when assessing the product's environmental impact. The first is forestry, and the others are related to chemicals use, emissions to air and water, and energy consumption in production of pulp and paper. By setting requirements on the aforementioned areas, Nordic Ecolabelling is able to set requirements that are relevant for the environment.

Paper products cover a large variety of different kinds of products. Characteristics and qualities of a paper are determined by the use of various pulp and chemicals. The characteristics and qualities of pulp are in turn determined by the various types of fibre and production processes used. There are three main types of pulp manufacturing processes: chemical, mechanical and production of pulp from recycled paper. These three methods have a different impact on the environment

- Mechanical pulp production may consume large amounts of electricity, but emissions to water and air are low and small amounts of chemicals is used. Yield is high, 85-95% of wood fibres are extracted and used.
- Chemical pulping processes give rise to large emissions, but chemical pulp mills are almost self-sufficient in energy, using biofuels for heat and electricity generation. The use of chemicals is high. For bleached chemical pulp, the process extracts only 45–50% of wood fibres from the raw material.
- The use of recycled paper has a limiting effect on the exploitation of forestry resources. Lower water and energy consumption are also attributed to paper made from recycled fibre. However, the deinking of recycled paper creates large amounts of sludge, for which an acceptable method of disposal must be found. The collection of used paper results in turn in an increase in the number of transports undertaken.

In this section, the environmental impact of the manufacturing of paper products is presented shortly. The following sections are divided into sustainably managed forestry, energy consumption, emissions to air and water and waste and recycling. Nordic Ecolabelling also sets requirements for chemicals used in production. The primary objective of chemical requirements is to limit and reduce potential impact to the environment, but health aspects are also considered. Requirements for chemicals are presented closely in Appendix 2.

Sustainably managed forests

Environmental benefits of the criteria are related to the opportunities to promote sustainably sourced renewable raw materials. Sustainable raw materials production entails using e.g. various certification schemes to ensure the traceability of the raw material and its origins. Certification systems protect e.g. forests from illegal felling and fulfil several different environmental requirements and social aspects. By setting a requirement that 70% of fibre raw material in paper must come from FSC or PEFC certified forestry, Nordic Ecolabelling supports the transition towards more sustainable forestry. Remaining fibre raw material in paper must be either controlled wood (FSC) or come from controlled sources (PEFC) ensuring that it is legally sourced or cannot originate from GMO species. Regarding recycled fibre, see also Waste, residual products and recycling below.

Energy consumption and effects on climate change

All production of cellulosic pulp and paper is energy intensive (including consumption of both fuels and electricity). Overall, the environmental impact of the production of cellulosic pulp is greater than that of paper manufacture. However, chemical pulp mills can achieve energy self-sufficiency due to using bio-fuels for production of process heat and electricity generation (on-site). Besides climatic impact and air emissions generated by the combustion of fuel, the production of primary energy sources and disposal of waste have an impact on the environment[1].

Energy savings have an important role to play in reducing the environmental impact[2]. With regard to global warming and climate change, the pulp and paper industry is in the unique position since its main raw material (wood) is renewable. As a result, waste and surplus energy may be utilized with a low climate impact. The main area of improvement lies in the systematic efforts to make production processes more energy efficient[3].

Nordic Ecolabelling has previously introduced requirements limiting quantities of fuel consumed in heat generation, as well as levels of electricity consumption, during the manufacturing of pulp and paper. Furthermore, Nordic Ecolabelling sets requirements on carbon dioxide emissions from the production phase of paper and pulp manufacture.

Emissions to water and air

Life cycle assessments have shown that environmental impact on emissions to air is primarily caused by the energy production required by the energy-intensive pulp and paper industry[4]. The industry is responsible for polluting the air with

[1] EC, 2015. PEF screening study for intermediate paper products. Available the registered stakeholders at: https://webgate.ec.europa.eu/fpfis/wikis/display/EUENVFP/PEFCR+Pilot%3A+Intermediate+paper+product

[2] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC111652/kjna29280enn_jrc111652_online_revised_by_ipo.pdf

[3] https://ec.europa.eu/energy/sites/ener/files/documents/151201%20DG%20ENER%20Industrial%20EE%20study%20-%20final%20report_clean_stc.pdf

[4] EC, 2015. PEF screening study for intermediate paper products. Available the registered stakeholders at: https://webgate.ec.europa.eu/fpfis/wikis/display/EUENVFP/PEFCR+Pilot%3A+Intermediate+paper+product

acidifying substances, such as sulphur, substances that lead to eutrophication, such as NOx, and substances that contribute to the greenhouse effect.

Emissions to water consists in, among others, substances that lead to eutrophication, such as nitrogen (N) and phosphorous (P), or that upset the balance between N and P. In sensitive environments, incidences of algal bloom and oxygen depletion may occur. The same effect occurs when organic compounds degrade and consume oxygen in water (measured as emissions of COD – Chemical Oxygen Demand).

Better bleaching chemicals, more effective methods of wastewater treatment and the optimisation of the manufacturing process have led to major reductions in absorbable organic halogen (AOX) emissions to water over the last few decades. AOX categorised compounds of chlorine have been replaced by less toxic compounds, as chlorine gas is no longer used in bleaching.

Emissions to air and water are taken into consideration by Nordic Ecolabelling in the setting of strict requirements to emissions to air and water during pulp and paper production, such as Sulphur (S), Phosphorous (P) and NOx.

Waste, residual products and recycling

Waste generated during production include bark, fibre residues and sludge arising from wastewater treatment or deinking of recycled paper. These residue products are currently mainly utilized as energy in the production process. Regarding by-products of kraft pulping, industry has ongoing projects to develop new renewable raw material for chemicals, fuels and materials to replace the present oil-based products[5, 6]. Pulp and paper mills, called biorefineries today, would for example, generate energy from sources with a low climate impact and side-streams that can be processed to new products. Examples of these are fibrous soil amendments[7] or chemicals extracted from lignin that may have numerous application possibilities. The BAT reference document (BREF) for the production of pulp, paper and board[8] also makes reference to the development of the biorefinery as one of the emerging techniques that will bring significant technological, economic and social advantages for this industry.

Paper becomes waste after use by the consumer. Paper can be recycled five to seven times, thus, contributing to circular economy[9]. Recycling is energy and resource efficient since the production of paper from virgin fibre requires greater resources than production from recycled fibre. The majority of used office paper, newspapers and other printed matter are collected as recycled paper. Several of the Nordic countries are approaching the theoretical limit for the possible collection of paper for recycling, which is set at 90%. Not all types of used paper are, however, suitable for recycling, e.g. paper for hygiene articles or wallpaper.

Nordic Ecolabelling sets requirements on waste treatment and disposal associated with production. The Nordic Swan Ecolabel also promotes the use of paper for recycling by setting requirement for a high proportion of recycled fibre

[5] https://www.uusipuu.fi/en/
[6] https://cris.vtt.fi/en/publications/from-biomass-to-value-added-furan-based-platform-chemicals-furche
[7] https://www.uusipuu.fi/en/ratkaisut/soil_amendments/ (2019-04-10)
[8] https://eippcb.jrc.ec.europa.eu/reference/BREF/PP_revised_BREF_2015.pdf
[9] http://ec.europa.eu/environment/circular-economy/index_en.htm

in Nordic Swan Ecolabelled paper as an alternative to the use of certified virgin fibre.

1.1 UN Sustainable Development Goals

The UN Sustainable Development Goals are a universal call to action to fight poverty and inequalities, protect the planet and tackle climate change by 2030. The Nordic Swan Ecolabel is a powerful tool for securing a sustainable future. The Nordic Swan Ecolabel actively contributes to reach goal 12: responsible consumption and production. Nordic Swan Ecolabelled paper products have less impact on the environment, and the requirements ensure control of the value chain.

How Nordic Swan Ecolabelled paper products contribute to Goal 12

- Fibre raw materials must be sustainably sourced and energy use in production is limited. This contributes to **sustainable management and efficient use of natural resources**.
- **Strict requirements for chemicals and emissions** limit the release of harmful substances to air and water. Thus, the Nordic Swan Ecolabel contributes to phasing out substances that are hazardous to health and the environment.
- To **reduce the amount of waste**, all waste from the production of pulp and paper must be **recycled** or **reused** when possible.

Nordic Swan Ecolabelled paper products also contribute to other UN Sustainable Development Goals, and this is how:

Reduces the use of chemicals harmful to health and the environment

- Strict requirements on chemicals
- Limits on emissions to water

Contributes to cleaner water

- Strict requirements on chemicals
- Limits on emissions to water

Improves energy efficiency

- Limits on energy consumption
- Limits on the emission of greenhouse gases

Prevents water pollution

- Strict requirements on chemicals
- Limits on emissions to air and water

Requires efficient use of resources

- Limits on energy consumption
- Limits on the emission of greenhouse gases
- Fibre raw materials must be sustainably sourced.

Promotes biodiversity and sustainable use of terrestrial ecosystems

- Fibre raw materials must be sustainably sourced
- Strict requirements on chemicals
- Limits on emissions to air and water

2 Justification of the requirements of the Basic Module

This chapter presents new and revised requirements, and explains the background to the requirements, the chosen requirement levels and any changes compared with previous generation 2 of the Basic Module. Requirement O8 in the Basic Module is applied to chemicals and therefore, justification of requirements in the Chemical Module is presented jointly in Appendix 2 in this background document.

2.1 Definition of the product group

No definitions of product groups are made in the Basic Module since the requirements stipulated in this document are only those basic requirements that apply generally to pulp and paper production. Differences in production methods that derive from the differing qualities of various paper products are dealt with in the supplementary modules for each product type.

Requirements for registered item for a specific use, Inspected Paper, including definition of paper grades eligible for use by Nordic Swan Ecolabelled printing companies, are set in Appendix 1 in the Basic Module.

2.2 Definitions for the Basic Module

Term	Explanation or definition
ADt	Air dry tonne (ADt) is dry solid content of pulp and paper where specific chemical and energy consumption, and emissions are expressed. ADt for pulp is 90%, while ADt for paper means a solid content of 94%.
AOX	Absorbable organic halogens. A measurement of the quantity of chlorine (and other halogens) associated with organic compounds.
BAT-AELs	The range of emission levels obtained under normal operating conditions using a best available technique or a combination of best available techniques, as described in BAT conclusions, expressed as an average over a given period of time, under specified reference conditions (Art 3.12. of Directive 2010/75/EU).
Broke	Broke is waste from production (scrap, strips from cutting the rolls at the paper mill etc.) and is not classified as recycled fibre.
Chemical	Please see "Production chemical".
Chemical product	Please see "Production chemical".
COD	Chemical oxygen demand. A measurement of the quantity of oxygen that is consumed during the chemical breakdown of organic material.
CTMP	Chemi-Thermomechanical Pulp
Deinking	Removal of inks/toners from a printed product by means of a deinking process.
DIP	Deinked Pulp – pulp made from paper for recycling from which inks and other contaminants have been removed.
DTPA	Diethlyene triamine pentaacetic acid (complexing/chelating agent used in peroxide bleaching).
ECF	Elemental Chlorine Free. Bleach sequence containing chlorine dioxide but not elemental chlorine gas.
EDTA	Ethylene diamine tetraacetic acid (complexing/chelating agent).
Electricity produced on site	Electrical energy produced on the mill site from different primary sources such as steam boilers, recovery boilers etc.
EMAS	Eco-Management and Audit Scheme, based on (EC) No 1221/2009.
Energy from renewable sources	Energy from renewable sources or 'renewable energy' means energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas (Directive 2009/28/EC).
External waste **water treatment**	An external water treatment plant is the plant on site where waste water is treated before discharge to recipient. Not to be mixed with wastewater treatment done by an external part such as municipal wastewater treatment plant. See also internal water treatment.

Fossil fuels	Coal, natural gas, peat and petroleum products (such as oil) from the decayed bodies of animals and plants that died millions of years ago.
Inspected paper	Inspected printing paper is paper without a Nordic Swan Ecolabelled licence but fulfills certain criteria set by Nordic Ecolabelling. Paper is a registered item for a specific use, that is approved for use in Nordic Swan Ecolabelled printing houses and used in printing of Nordic Swan Ecolabelled printed matter. Requirements for inspected printing paper are set in the Appendix 1 in the Basic Module.
Integrated production	Integrated production means that pulp and paper are produced in the same plant. See also non-integrated pulp and paper mills.
Internal waste **water treatment**	Internal water treatment means processes on site where process water is sometimes treated between different processes and thereafter water is recycled within the production plant. See also external waste water treatment.
My Swan Account	Nordic Ecolabelling's web-based application tool for paper and paperboard manufacturers. The tool also applies to pulp and chemicals producers wishing to have their products assessed by Nordic Ecolabelling.
Non-integrated pulp and paper mills	Non-integrated pulp mills (market pulp) produce pulp that is sold on the open market. Non-integrated paper mills are using purchased pulp for their paper production.
NOx	Collective chemical symbol for nitrogen oxides (NO, N_2O and NO_2). In this document, NOx refers to the total of NO and NO_2, expressed as NO_X.
NSSC	Neutral Sulphite Semi-Chemical pulp
P	The chemical symbol for phosphorus. In this document, P refers to total emissions of phosphorous compounds to water.
PEF	Product Environmental Footprint, a project initiated by the EU Commission with the aim of developing a harmonized environmental footprinting methodology to measure environmental performance throughout the lifecycle.
Plant	Cellulosic fibres such as those from wood and bamboo can be used in production of Nordic Swan Ecolabelled paper products. If fibres from other plants are included in the product group, contact Nordic Ecolabelling. Nordic Ecolabelling will determine which new fibres may be included in the product group.
Production chemical	Collective term for chemical products used during production of pulp and paper. It can refer to chemical additives, auxiliary chemicals and process chemicals. The term is further used to refer to starch, filler material and so on. Even waste water treatment chemicals are included, see closely Appendix 2 where background to the Chemical Module is presented.
Purchased electricity	Electrical energy bought from outside the mill to be used on site.
Recycled material	Recycled material is defined in accordance with ISO 14021 in the following two categories. Material in the pre-consumer phase. Material that has been taken from the waste flow during the manufacturing process. The

	exception is the re-use of material that is generated in a process, e.g. waste that can be recycled within the same process that generated it. Material in the post-consumer phase. Material generated by households or by trade, industry or institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose. This includes the return of materials from the distribution chain.
Recycled pulp	Pulp manufactured from paper for recycling and used for the manufacture of paper.
Residue	Residue means a substance that is not the end product(s) that a production process directly seeks to produce; it is not a primary aim of the production process and the process has not been deliberately modified to produce it.
S	The chemical symbol for the element sulphur. In this document, all forms of sulphur compounds emitted in gaseous form to air are recalculated to the total S before used in calculations.
Sold electricity	Electrical energy produced on site and sold to the public grid network or other electricity consumers.
TCF	Totally Chlorine Free. Bleaching of pulp without using chlorine compound chemicals
TMP	Thermomechanical pulp
TOC	Total organic carbon. TOC may be used in place of COD if the applicant demonstrates how these two methods of analysis correlate with each other. See also COD.
Wood fibre	Wood fibre may consist of virgin fibre from timber or sawmill chippings. Wood shavings and sawdust are residuals and not regarded as virgin fibres.

2.3 Information about production

This Basic Module imposes requirements on pulp and paper production.

The following requirements must be fulfilled by **paper manufacturers**: O1–O6, O7 (certain sections), O8–O11 and O14–O16.

The following requirements must be fulfilled by **pulp manufacturers**: O1–O6, O7 (certain sections), O8–O11, O12–O13 and O14–O16.

Note that some requirements, such as those on energy and emission to water and air, require that the paper manufacturer collect information from the pulp manufacturer.

Note also that in addition to fulfilling these requirements, a Nordic Swan Ecolabelled paper product must fulfil the requirements in the Chemical Module and the applicable Supplementary Module.

O1 General comments on documentation

The pulp/paper manufacturer must submit documentation that demonstrates fulfilment of all the pertinent requirements of this Basic Module. The documentation required is to be submitted with the aid of the web-based application tool.

A spreadsheet for energy and emissions has been developed by Nordic Ecolabelling and is to be used for these calculations.

The pulp manufacturer is not required to submit new documentation for market pulp that has already been assessed by Nordic Ecolabelling.

If the paper manufacturer operates other reporting systems, such as EMAS, ISO 14 000 or reports to the authorities, this information may be approved if it is sufficiently specific to the product and if the basis for calculation is the same as that used by Nordic Ecolabelling. Documentation from other audit systems must provide clear reference to the applicable requirements.

Overview of the above points can be found in the web-based application tool.

Background to requirement

This requirement is unchanged. However, it is now made clear that the documentation required are to be submitted with the aid of the web-based application tool, My Swan Account

This requirement describes the procedure for application. The requirement is relevant to both pulp and paper manufacturers. Pulps used in the paper must be assessed and listed at the Nordic Ecolabelling's website or in the application tool[10]. The pulp producer is responsible for the application of pulp. Pulp manufacturer shall, however, send pertinent information on the pulp to the paper manufacturer, upon request. Paper manufacturer needs information on pulps to verify that the paper complies with the requirements of Nordic Ecolabelling.

[10] http://www.nordic-ecolabel.org/certification/paper-pulp-printing/

Among other things, the requirement presents a description of the documentation acceptable as part of an application. For example, if market pulp has already been assessed according to the currently valid generation of the Basic Module, there is no need to submit documentation again. This measure simplifies the application process, and the documentation needed, for all parties involved. It has also been clarified that paper applicant must use Nordic Ecolabelling's spreadsheet for calculations.

O2 Type of pulp and paper

The pulp/paper manufacturer shall provide information regarding the type of pulp and paper.

Paper manufacturer. A technical description of the paper, its intended use and its composition shall be submitted. The description must include the name and production site of ingoing pulp, the proportion of the ingoing pulps (ADt/tonne paper) and the grades in which the paper is available. The documentation must specify whether the paper is coated or uncoated and the grammage in which the paper is available.

Pulp manufacturer. Information on pulp – producer, name, production site, type of pulp (such as ECF, TCF etc., market pulp or not). Specific requirements may apply to individual pulp types.

Description of the above points in the web-based application tool.

O3 Production technology

The pulp/paper manufacturer shall submit information on the production method and technology used for the pulp/paper. Specify whether the pulp comes from integrated production.

Paper manufacturer. A description of the manufacturing process used in the papermaking shall include

- all stages of the process, from the purchasing of the pulp raw material/paper for recycling to winding the paper onto rolls, for example slushing, grinding, the addition of chemicals, drying, coating,
- a description of the water circulation system, method of internal and external wastewater treatment, including sampling points for emissions to water,
- a description of energy system, type of fuels used in each production phase, including the air emission measurements methods and air emission sampling points.

Pulp manufacturer. A description of the manufacturing process used in production of pulp shall include

- all ingoing sub-processes, from the point at which the fibre raw material/paper for recycling passes the plant gates to the point at which the pulp leaves the pulp mill,
- a description of the water circulation system, method of internal and external water treatment, including sampling points for emissions to water,

- a description of energy sources such as boilers and driers, type of fuels used in boilers/driers, including the air emission measurements methods and air emission sampling points.

The deinking of recycled fibre is also considered a pulp process.

🖱 Description of the above points in the web-based application tool.

Background to requirements

The requirements are unchanged. The requirements set out how the producer should provide information on the pulp and paper types that are used in the production of Nordic Swan Ecolabelled/inspected paper products. These are significant requirements, in that it is important to be informed of the methods of production employed in the manufacture of the product, since the environmental impact and energy consumption of different production techniques may differ considerably.

2.4 Quality and regulatory requirements

O4 Regulatory requirements

The pulp/paper manufacturer shall ensure compliance with all applicable local laws and provisions at all production sites in production of pulp/paper for Nordic Swan Ecolabelled product, e.g. with regard to safety, working environment, environmental legislation and site-specific terms/permits.

✉ Duly signed application form.

O5 Quality assurance

The pulp//paper manufacturer respectively are responsible for ensuring that the quality of the pulp or paper in the Nordic Swan Ecolabelled product is maintained throughout the period of validity of the licence or as long as the pulp/paper constitutes a part of the ecolabelled product.

The pulp/paper manufacturer shall ensure that:

- All requirements in the ecolabelling criteria that are relevant to the pulp/paper manufacturer are fulfilled and that they are verifiable during the validity period of the licence or as long as the pulp/paper constitutes a part of the Nordic Swan Ecolabelled product. Refer to the Annual follow-up (O16).
- The Nordic Swan Ecolabelled paper can be traced throughout the entire production process from raw material to finished product.
- Unforeseen non-conformities or planned changes in production, which may affect the product's ability to fulfil the ecolabelling requirements, are reported to Nordic Ecolabelling without delay.
- A person within the organization is assigned the responsibility and authority to guarantee that the requirements of the ecolabelling criteria are fulfilled.
- A contact person, responsible for reporting to Nordic Ecolabelling, is appointed.

The paper manufacturer shall have written permission from Nordic Ecolabelling before carrying out any changes that may be of relevance for the fulfilment of the ecolabelling requirements. Examples of such changes are a change of recipe (pulp mixture), exchanging raw materials such as pulps and chemicals, and new production methods (trials are excluded).

The pulp/paper manufacturer shall provide confirmation of the above by completing the web-based application tool.

O6 Quality manual

The pulp/paper manufacturer must follow written procedures from the company's quality manual for the production of pulp/paper for ecolabelled products. These are:

1. Procedures for securing the traceability of Nordic Swan Ecolabelled product through the entire production process.
2. Procedures for handling non-conformities and changes in the production of the Nordic Swan Ecolabelled product and reporting these to the contact person and Nordic Ecolabelling.
3. Procedure for logs and annual reports.

The pulp/paper manufacturer shall provide confirmation of the above by completing the web-based application tool. On initial application, the applicant shall also submit a copy of procedures to Nordic Ecolabelling.

The following documents must be kept available in the event of an inspection visit:

- Background data to the documentation that is submitted along with the application.
- Journals of unforeseen deviations and planned production changes in the production of the ecolabelled product.
- Quality manual with procedures for the production of the pulp/paper in ecolabelled products.
- Complaints and claims relating to the paper in ecolabelled products.

Background to requirements

The requirements are unchanged apart from slight amendments of texts. Equivalent quality and regulatory requirements are always included in Nordic Ecolabelling's product criteria. The purpose of these is to ensure that fundamental quality assurance and applicable environmental requirements from the authorities are dealt with appropriately. They also ensure compliance with Nordic Ecolabelling's requirements for the product throughout the period of validity of the licence or as long as the pulp/paper constitutes a part of the Nordic Swan Ecolabelled product. The requirement provides also an intrinsic possibility that exceptional operating conditions can be subtracted from normal operating conditions after agreement with Nordic Ecolabelling.

2.5 Fibre raw material

This requirement applies to cellulosic fibres such as those from wood and bamboo. Other relevant cellulosic fibres may be included in the product group upon request. Nordic Ecolabelling will determine which new fibres may be included in the product group.

O7 Fibre raw material

The requirement consists of four parts that all must be fulfilled, either by the pulp manufacturer or the paper manufacturer, or both:

a) Virgin tree species listed on Nordic Ecolabelling's list of restricted tree species* must not be used in pulp/paper.

The list consists of tree species listed on:

i. CITES (Appendices I, II and III)
ii. IUCN red list, categorized as CR, EN and VU
iii. Rainforest Foundation Norway´s tree list
iv. Siberian larch (originated in forests outside the EU)

Exemptions

Eucalyptus and Acacia used for pulp and paper production are exempted from the list (note **).

Tree species listed on either ii, iii or iv may be used if it meets all of the following requirements:

- the tree species does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU.
- the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 http://www.intactforests.org/world.map.html.
- the tree species shall originate from FSC or PEFC certified forest/plantation and shall be covered by a valid FSC/PEFC chain of custody certificates documented/controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method. Tree species grown in plantation shall in addition originate from FSC or PEFC certified forest/plantation, established before 1994.

b) **The pulp manufacturer** must state the name (species name/scientific name) of the fibre raw material used in the production of pulp.

c) **The pulp and paper manufacturer** must be Chain of Custody certified in accordance to FSC or PEFC. All fibres shall be covered by valid chain of custody certificates issued by FSC or PEFC or be classified as recycled material***.

d) Certification of fibre raw materials in paper:

1. On an annual basis/the latest 12 months, a minimum of 70% (note **) of the fibre raw material that is used in the paper shall originate from forestry certified under the FSC or PEFC schemes,

   or

2. The paper must consist of a minimum of 70% of recycled fibres or be labelled as FSC or PEFC recycled,

   or

3. A combination of certified and recycled fibres. If the paper contains both recycled and certified fibres, the sum of these fibres shall in total be a minimum of 70%.

   The proportion of fibre raw material in the paper taken from certified sources and the proportion of recycled fibres, is calculated as a weighted total of the proportion in each constituent pulp.

   The remaining proportion of fibre raw material must be covered by the FSC/PEFC control schemes (FSC controlled wood/PEFC controlled sources).

   Certified wood raw material must be accounted/recorded to the paper/ production line. For paper labelled with FSC / PEFC or EU Ecolabel, no documentation is required, the requirement is considered to be met.

** The list of restricted tree species is located on the website: http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements-2020/*

*** Regarding pulp, fibre raw material from eucalyptus/acacia must be a minimum of 70% certified.*

**** Recycled material defined according to ISO 14021 in the following two categories:*

Pre-consumer material: Material diverted from the waste stream during a manufacturing process. Excluded is reuse of materials such as broke generated in a process and capable of being reused within the same process that generated it.

Post-consumer material: Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

⇪ Declaration from the **pulp manufacturer** that tree species listed on i-iv) are not used. Regarding acacia/eucalyptus, documentation showing that the quantity of certified fibre in pulp is met. Appendix 2 shall be used.

If species from the lists ii), iii) or iv) is used:

The applicant/manufacturer/supplier are required to present a valid FSC/PEFC Chain of Custody certificate that covers the specific tree species and demonstrate that the tree is controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.

- The applicant/manufacturer/supplier are required to document full traceability back to the forest/certified forest unit thereby demonstrating that;

    - the tree does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU;
    - the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 http://www.intactforests.org/world.webmap.html;
    - For plantations the applicant/manufacturer/supplier are required to document that the tree species does not originate from FSC or PEFC certified plantations established after 1994.

- **Pulp manufacturer** shall describe name (species name) on the fibre raw material used in the pulp.

- **Pulp/paper manufacturer** must present a valid FSC/PEFC Chain of Custody certificate covering all fibre raw material used in the pulp/paper (e.g. via link to website).

- Recycled fibres shall be covered by EN 643 delivery notes if FSC or PEFC recycled claims are not used.

- **Paper manufacturer** shall enclose documentation that paper is labelled with FSC / PEFC or EU Ecolabel or e.g. a third party-controlled balance sheet from CoC credit account system or a rolling average of the certification percentage on a production line showing that the quantity of certified fibre raw material in paper is met. Nordic Ecolabelling may request further documents to examine whether the requirements are fulfilled.

Background to requirement

The requirement for fibre raw material is updated to meet the Nordic Ecolabelling's general forestry requirement[11].

Nordic Ecolabelling's general forestry requirements were introduced in 2015 with the following

- 70 percent of all wood must be certified or classified as recycled material. The percentage can, however, differ in different product groups.
- Remaining wood raw material must be either controlled wood (FSC) or come from controlled sources (PEFC).
- Certain wood species shall not be used in Nordic Swan Ecolabelled products.

The general requirement was implemented in the valid Basic Module, version 2 in 2016 as an alternative method with the following amendments:

- the level of certification was adjusted from 70% to 50%.

[11] http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements-2020/

- Documentation of the degree of certification per product / production line was allowed. This was done to avoid complex accounting per paper. In practice, it means that the manufacturer can, if necessary, document that the Nordic Swan Ecolabel paper can be manufactured on production line where the degree of certification is continuous over at least 50%. With production line paper machine or similar is meant.
- The current requirement for recycled material (75%) in the Basic Module was also introduced in the requirement with certain clarifications of recycled material.

In this revision, the requirement has been re-checked. The ambition level has been raised from 50% to 70% in Nordic Swan Ecolabelled paper. This also applies to inspected paper that is used in Nordic Swan Ecolabelled printing companies, see Appendix 1. This is in line with the FSC and PEFC claims used in labelling. The degree of certification is also set to 70% for graphic paper in EU Ecolabel's recently published criteria for paper products. The level is justified by statistics of Eurostat and FSC/PEFC[12].

Regarding recycled fibres, the Nordic Ecolabelling's current structure of the requirement is maintained. Ambition level is set to a minimum of 70% (from previous 75%) with the addition that paper labelled as PEFC / FSC recycled (> 70%) is also accepted. If PEFC/FSC recycled claims are not used, then a requirement of a minimum of 70% or combination of recycled / certified material in the paper must be fulfilled. In that case, verification shall be covered by EN 643 delivery notes. The adjustment from 75% to 70% is justified by a simplified documentation burden.

A number of tree species are restricted or not permitted for use in Nordic Ecolabelled paper. The requirement applies only to virgin forest tree species and not tree species defined as recycled material according to ISO 14021.

The list of restricted tree species is based on the wood species that are relevant to Nordic Ecolabelling's criteria, i.e., tree species that have the potential to be included in Nordic Ecolabelled products. Listed tree species are indicated by the scientific name and the most common trade names. The scientific name/trade name is not always adequate, as there may be more than one scientific name/trade names for the listed tree species than the list indicates.

Criteria for tree species found in the list are wood originating from:

i) Tree species listed on CITES Appendices I, II and III.

ii) IUCN red list, categorized as critically endangered (CR), endangered (EN) and vulnerable (VU).

iii) Regnskogsfondet[13] (Rainforest Foundation Norway) tree list

iv) Siberian larch (originated in forests outside the EU)

[12] http://ec.europa.eu/environment/ecolabel/documents/tissue_paper_tr_2019.pdf
[13] https://www.regnskog.no/no/hva-du-kan-gjore/unnga-tropisk-tommer/tropiske-treslag (visited January 2020)

CITES[14] is an international convention for the control of trade (across borders) of wild fauna and flora. CITES includes around 5600 animal species and around 28.000 plant species wherein a part is relevant timber tree species (mainly tropical species). The tree species is, dependent on how threatened they are, listed in Appendix I, II or III. Species listed in Appendix I, are highly endangered and trade with these species is totally banned. For the remaining tree species, special permits for import and export is required (Appendices II and III). CITES is regulated by EU legislation (Council Regulation (EC) No 338/97) and trees with valid CITES permits are considered to be legally harvested under EUTR (EU Timber Regulation). Nordic Swan Ecolabel's ban on the use of tree species listed in CITES (Appendix I, II or III) goes beyond the EU legislation. CITES regulates trade in endangered species, and there are also challenges with corruption in the trade in wild animals and plants[15]. Therefore, Nordic Ecolabelling does not want to approve species on any of the appendices.

IUCN Red Lists[16] are the world's most comprehensive inventory of the global conservation status of the planet's biological species, including trees. IUCN Red List has established clear criteria to assess the risk of extinction among thousands of species and subspecies according to the origin of the tree species. These criteria cover all countries and all species in the world. Nordic Swan Ecolabelling is aware that the IUCN's red list system only focuses on the extinction risk of species, and therefore is not designed for an overall assessment of whether a tree species can be provided with sustainable origin. However, the list is continually being updated and thereby is an important tool to estimate a specific tree species' conservation status on a global scale. Nordic Swan Ecolabel wishes to prohibit tree species listed as endangered (categories CR, EN and VU).

Regnskogfondet[17] (Rainforest Foundation Norway) is an NGO in Norway that works to protect the world's remaining rainforests. Currently, Regnskogsfondet does not see any credible certification schemes working in the tropics, and therefore recommends full stop of buying tropical timber. Regnskogsfondet has developed a list of tropical tree species based on tree species found on the Norwegian market. This list works as a guide to comply with Norwegian guidelines regarding non-use of tropical wood in public construction. We consider this a pragmatic approach for handling tropical tree species on the Nordic market.

[14] https://www.cites.org/ (visited January 2020)
[15] Addressing corruption in CITES documentation processes Willow Outhwaite, Research and Analysis Senior Programme Officer, TRAFFIC, 2020: https://www.traffic.org/site/assets/files/12675/topic-brief-addressing-corruption-in-cites-documentation-processes.pdf
[16] http://www.iucnredlist.org/ (visited January 2020)
[17] https://www.regnskog.no/no/hva-du-kan-gjore/unnga-tropisk-tommer/tropiske-treslag (visited January 2020)

In addition, Siberian larch (originated in forests outside the EU) is on the tree list. Siberian larch is a coveted tree species in the construction industry due to its high quality. The tree species is widespread in the Eurasian northern boreal climate zone, and particularly the species Larix sibirica, Larix gmelinii, Larix cajanderi and Larix sukaczewii are widespread in the large areas of intact forest landscapes (IFL) in Russia. Siberian larch is to be seen as an indicator species for boreal IFL-areas which are important to keep intact.

Exemption for the use of **Eucalyptus and Acacia** in criteria document where pulp and paper are used.

Eucalyptus and Acacia used for manufacturing pulp and paper are exempted from the list as these species are grown in plantations for the specific use in the pulp and paper industry. Fibre raw material from acacia/eucalyptus must, however, be a minimum of 70% FSC/PEFC certified. The remaining proportion of fibre raw material must be covered by the FSC/PEFC control schemes.

Annual follow-up: The applicant/manufacturer shall report pulps (name of pulps) used in the production of Ecolabelled products. This insures that the eucalyptus/acasia pulps contains min 70% certified raw materials.

Exemption from the tree list

Nordic Swan Ecolabelling is aware that tree species originating from ii), iii) or iv) can originate from legal and sustainable forestry. Therefore, it is possible to use tree species listed on ii), iii) or iv) if the applicant/manufacturer/supplier can demonstrate compliance with a number of strict requirements regarding certification and traceability.

Many of the tree species on the list are grown in countries which still have large areas of IFLs. These are important to protect due to biodiversity and climate. Many of these countries also have a high risk of corruption and the national legislation related to environment, human rights and ownership to land are weak and/or not controlled by the authorities. There are different views on whether certification is good enough to meet the challenges of forest management in land with a high risk of corruption and illegal logging. For instance, relevant challenges related to this have been published by Danwatch in a number of articles in 2018 [18,19] and by redd-monitor.org in 2019[20]. Greenpeace International has ended its memberships in FSC on the grounds that the certification body is no longer meeting its aims of protecting forests and human rights[21]. Other environmental organisations like WWF support certification as an important tool for sustainable forestry in these countries. However, due to the uncertainty whether FSC and PEFC certification systems are good enough in protecting important areas of biodiversity and ethical aspects like human rights and land

[18] https://danwatch.dk/undersoegelse/dokumentfalsk-og-millionboeder-danske-byggemarkeder-saelger-trae-forbundet-til-ulovlig-hugst-i-amazonas/
[19] https://danwatch.dk/undersoegelse/baeredygtighedsmaerke-er-ingen-garanti-for-baeredygtigt-trae/
[20] https://redd-monitor.org/2019/08/29/evicted-for-carbon-credits-new-oakland-institute-report-confirms-forced-evictions-for-green-resources-plantations-in-uganda/
[21] https://www.greenpeace.org/international/press-release/15589/greenpeace-international-to-not-renew-fsc-membership/

ownership in areas with a high risk of corruption, Nordic Ecolabelling have a precautionary approach and wants further documentation about the tree species and its origin.

In order to document full traceability of the tree species, the applicant/manufacturer/supplier must present a valid FSC/PEFC Chain of Custody certificate that covers the specific tree species and demonstrate that the tree is controlled as FSC or PEFC 100%, through the FSC transfer method or PEFC physical separation method. This means that Nordic Swan Ecolabelling does not accept the FSC percentage or credit control system as well as PEFC percentage system. Full traceability of the tree species back to the forest/certified forest unit, enables the applicant/manufacturer/supplier to document that the tree species does not come from an area/region where it is IUCN red listed, categorized as CR, EN or VU. Full traceability also makes it possible to document that the tree species does not come from Intact Forest Landscape (IFL), defined by Intactforest.org in 2002[22]. Intactforest has been monitoring IFL-areas since 2000 and has developed an online up to date mapping tool that shows the extent of IFL back to 2002. The monitoring results shows that the world's IFL are being degraded in an alarming speed, and that is the reason for Nordic Swan Ecolabelling referring back to 2002.

Plantation: Nordic Swan Ecolabelling believe, that responsibly run forest plantations can play a role in preserving natural IFLs by reducing the pressure to harvest the world's remaining natural forests. In order to secure that plantation has not replaced native ecosystems (forest/grasslands) within the last 25 years, tree species has to come from FSC or PEFC certified plantations that were established before 1994. 1994 is in line with FSCs international forest management standard (version 5.2), whereas PEFC is working with 2010.

The list of restricted tree species is located on http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements-2020/.

If the applicant does not use tree species listed on i)-iv):

The requirement can be documented by a declaration from the applicant stating that tree species with restricted use in Nordic Ecolabelled product are met. Annex 2 in the Basic Module may be used. Nordic Ecolabelling may demand more documentation for a specific tree species.

2.6 Chemicals

O8 Chemicals

The pulp/paper manufacturer must report all production chemicals used in the production of pulp and paper and in conversion of paper products, providing documentation regarding the product's complete name, function, area of use in the mill, supplier and quantities used in kg/tonnes pulp/paper. The requirement further applies to internal and external water treatment, see terms and definitions.

[22] http://www.intactforests.org/world.webmap.html, visited January 2020

The chemicals used in the production of the pulp and paper must fulfil the requirements in the Chemical Module, version 3. This is mainly to be documented by the manufacturer or supplier of the chemical product.

Please note that requirements O1, O4, O6 and O8 in the Chemical Module include sub requirements that pulp/paper manufacturer shall declare in the web-based application tool.

To reduce the release of not readily biodegradable organic chelating agents such as EDTA or DTPA, techniques in line with Best Available Techniques (BAT) Reference Document for the production of Pulp, Paper and Board is to be used.

The documentation required is to be submitted with the aid of the web-based application tool.

⇪ **The pulp/paper manufacturer** shall submit a list of the chemical products used in the production of pulp/paper, see also Appendix 3 in this document. Product safety data sheets for chemical products shall be included upon request. Safety data sheet/product specification must be in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC). Regarding EDTA and DTPA, declaration of techniques in line with BAT.

Background to requirement

Requirement regarding chemicals is amended by merging it with the requirement concerning pulp/paper manufacturer in the current Chemical Module, version 2. This is done to clarify which requirement is applied to pulp/paper manufacturer and which concerns chemical supplier. From now on, generation 3 of the Chemical Module shall mainly be used by chemical suppliers/manufacturers. However, requirements O1, O4, O6 and O8 in the Chemical Module contain sub requirements that shall be declared by the pulp/paper manufacturer in the web-based application tool.

Requirement O8 stipulates that chemicals used in pulp and paper production must comply with the requirements outlined in the Chemical Module version 3. To reduce the release of not readily biodegradable organic chelating agents such as EDTA or DTPA, techniques in line with Best Available Techniques (BAT) Reference Document for the production of Pulp, Paper and Board is to be used. See also closely chelating agents in chapter 4.

A more detailed background to requirements for chemicals is provided in Appendix 2 in this document.

2.7 Energy and greenhouse gases

Energy consumption is regulated through requirements on fuel and electricity while fuel type used for production of heat is regulated by CO_2 emission requirements. The requirements are based on information about the actual energy consumption in production in relation to a specified reference value. The ratio between actual energy consumption and the reference value translates to an energy score.

The energy calculation encompasses the entire production process – both paper manufacturing and the constituent pulp. The calculation for paper does not

include filler. Energy calculations do not include energy consumed during transport of raw materials or in converting and packaging. The paper manufacturer shall verify the fulfilment of the the requirement.

Pulp manufacturers shall, however, provide details of energy use and CO_2 emissions to paper producer. See also Appendix 4 in the Basic Module where instructions for calculations are given.

O9 Total energy score

The following requirement must be fulfilled for paper unless specified otherwise in the supplementary module for the specific paper product.

$P_{electricity\_total} < 2.5$

$P_{fuel\_total} < 2.5$

For paper comprising solely of TMP/GW produced on-site, the limit value for P_{fuel_total} is 1.25.

$P_{electricity\_total}$ and P_{fuel_total} include the energy scores from paper production and the pulps that are used.

The pulp/paper manufacturer shall submit calculations in accordance with Appendix 4 to demonstrate fulfilment of the requirement. Worst case calculations shall be enclosed to demonstrate that each pulp recipe meets the requirements in case pulp mixture specific calculations are not documented for each pulp mix. Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

O10 Emissions of greenhouse gases

The emission of greenhouse gases from fuels used for production of process heat must not exceed the following limit values:

- 575 kg CO_2 /tonne paper for paper made from 100 % deinked/recycled pulp
- 500 kg CO_2 /tonne paper for paper made from 100 % chemical pulp
- 550 kg CO_2 /tonne paper for paper made from 100 % mechanical pulp

For paper comprising a mixture of chemical pulp, recycled pulp and mechanical pulp, a weighted limit value is calculated based on the proportion of each pulp type.

The pulp/paper manufacturer shall submit calculations in accordance with Appendix 4 to demonstrate fulfilment of the requirement. Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

Background to requirements

As all energy production have environmental impact, Nordic Ecolabelling focuses on limiting energy consumption and contributing to energy efficiency in production of pulp and paper. According to Nordic Ecolabelling's general principles the focus is primary to limit the energy consumption and promote the use of energy sources with low environmental and climate impact. Regarding requirements set for energy, Nordic Ecolabelling aims to identify pulp and paper products that are manufactured using energy efficient production methods and

that emit low levels of greenhouse gases. Requirements are set with regard to electricity and fuel consumption. Carbon dioxide emissions are regulated in a separate requirement with respect to fuels used in producing process heat. Regarding requirement for CO_2 emissions originating from transport in version 2 of the Basic Module, the requirement has been removed, see closely chapter 4 Changes compared to previous version.

Energy

In this generation 3 of the Basic Module

- Reference values for fuel and electricity have been tightened.
- Total energy score calculation has been adjusted in order to balance the calculation between pulp mill and paper mill. Point scores of pulp mill dominated the calculation of the final energy scores and in order to make the comparison equal, the equation has been changed, see also closely 4.3.4. in Appendix 4 in the Basic Module. Consequently, the P_{total} score limit values have been adjusted from 1.25 to 2.5. For paper comprising solely of TMP/GW produced on-site, the limit value for P_{fuel_total} 1.25 remains.
- New reference values have been introduced, namely for kraftliner, testliner, wellenstoff, semichemical fluting and correspondingly, for NSSC (neutral sulphite semi chemical) pulp used in fluting.

Reference values for energy

The requirement for energy is based on information on actual energy use in production in relation to a specified reference value. Each pulp and paper manufacturing process has been assigned a particular reference value. In this way the best pulps produced from each method of manufacturing may be included in the category of Nordic Swan Ecolabelled products.

The currently applicable reference values given in the Basic Module version 2 were based on licencing data of Nordic Ecolabelling and BAT values laid out in a draft version of the BREF in April 2010[23]. The BREF document was itself issued later in 2015[24]. The proposed reference values in version 3 of the Basic Module are mainly based on licencing data of Nordic Ecolabelling and data gathered from paper used in Nordic Swan Ecolabelled printing companies. Published data available is also used[25]. The analysis of the recent annual updates indicated that pulp and paper mills have implemented energy efficiency measures during the recent years and therefore, the proposed reference values have been tightened between 0% and 25% compared to previous version 2 of the Basic Module. In general, the pulp and paper industry have a large potential for energy optimisation[26,27] e.g. through new investments but also through generally applicable heat recovery and optimisation of the processes such as dewatering

[23] Draft 1 BREF-document for Pulp and Paper Industry, 2010. Reference documents from the European IPPC Bureau. http://eippcb.jrc.ec.europa.eu/reference/
[24] http://eippcb.jrc.ec.europa.eu/reference/BREF/PP_revised_BREF_2015.pdf
[25] https://www.skogsindustrierna.se/skogsindustrin/branschstatistik/miljodatabas/
[26] https://ec.europa.eu/energy/sites/ener/files/documents/151201%20DG%20ENER%20Industrial%20EE%20study%20-%20final%20report_clean_stc.pdf
[27] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC111652/kjna29280enn_jrc111652_online_revised_by_ipo.pdf

and pumping during production. Future trends for specific energy consumption in the pulp and paper industry are expected to show a continued decrease. It has been estimated that even with increased production, by 2050 the European pulp and paper industry can reduce its energy consumption by 14% and greenhouse gas (GHG) emissions by 62% compared to 2015 levels[28].

Some new reference values have been introduced in the Basic Module, namely for kraftliner, testliner, wellenstoff, semichemical fluting and regarding pulps, for NSSC (neutral sulphite semi chemical) used in fluting. New reference values are mainly based on the European Federation of Corrugated Board Manufacturers' (FEFCO) LCA database[29]. Aforementioned types of pulp and board are used in production of corrugated board that is in turn used as a raw material by Nordic Swan Ecolabelled printing companies.

Table 1 shows a comparison of the old and new Nordic Ecolabelling reference values for paper. Reference values for pulps are presented in Table 2, respectively. The tables also include data gathered from the recently adopted EU Ecolabel Criteria for Graphic Paper[30]. Nordic Ecolabelling's new reference values for paper manufacturing are lower than the values given for EU Ecolabel. Reference values for pulp manufacturing are lower or equal to the equivalent EU Ecolab values, depending on the pulp type.

Table 1 Reference values for paper manufacturing. For comparison, reference values in the current Nordic Ecolabelling (NE) of Basic Module, version 2 and in the EU Ecolabel criteria published in January 2019 are shown.

	NE Basic Module 2		NE Basic Module 3		EU Ecolabel 2019	
Process	Fuel	Electricity	Fuel	Electricity	Fuel	Electricity
	kWh/ADt Ref. value					
Folding box board (FBB) Solid bleached sulphate (SBS)/ Solid bleached board (SBB) Solid Unbleached Board (SUB) White lined chipboard (WLC)	1700	800	1600	650		
Kraft liner			1600	650		
Fluting			1600	650		
Testliner/wellenstoff			1700	500		
News	1700	750	1500	600		
LWC	1700	800	1600	650		
SC	1700	750	1500	600		
Uncoated fine paper	1700	750	1600	600	1700*	750
Coated fine paper	1700	800	1600	650	1700**	800

* magazine paper (SC) newsprint also included

** coated magazine paper (LWC, MWC) included

[28] https://ec.europa.eu/jrc/en/news/how-eu-pulp-and-paper-industry-can-reduce-greenhouse-gas-emissions
[29] http://www.fefco.org/lca
[30] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0070&from=EN

Table 2 Reference values for pulp manufacturing. For comparison, reference values in the current Nordic Ecolabelling (NE) of Basic Module, version 2 and in the EU Ecolabel criteria published in January 2019 are shown.

	NE Basic Module 2		NE Basic Module 3		EU Ecolabel 2019	
Process	Fuel	Electricity	Fuel	Electricity	Fuel	Electricity
	kWh/ADt Ref. value					
Bleached chemical pulp	3750	750	3600	650	3650	750
Dried bleached chemical pulp	4750	750	4600	700	4650	750
Unbleached chemical pulp	3200	550	3200	550		
Dried unbleached chemical pulp	4500	550	4200	600		
NSSC			3200	700		
Dried NSSC			4100	750		
CTMP	N/A	2000		1500	0	1800
Dried CTMP	1000	2000	900	1550	800	1800
DIP	350	500	300	450	350	600
Dried DIP	1350	600	1200	500	1350	600
TMP	N/A	2200		2200	0	2200
Dried TMP	1000	2200	900	2250	900	2200
Groundwood pulp	N/A	2000		2000	0	2000
Dried groundwood pulp	1000	2000	900	2050	900	2000

Total energy score

In addition to comparison with reference values, energy consumption is regulated by a total energy score. In order to calculate total energy scores, separate for fuel and electricity, the actual, specific values for electricity and fuel consumption are first divided by the reference values for both pulp and paper and finally, summed up for total energy scores.

This limit defines how much of the paper product's total energy consumption may be permitted to exceed the level of consumption recorded under optimal conditions. As in the current version 2 of the Basic Module, a point limit of 1.25 indicates that the average value of the paper product's total energy consumption may not rise above a level that is 25 % higher than the rate of energy use set by the relevant reference value. The points model permits a higher level of energy consumption in order to allow the paper manufacturer an increased degree of flexibility.

This flexibility is necessary since the criteria stipulate several requirements; and each must be met. The various environmental parameters, such as energy consumption and treatment of emissions, are, to a certain degree, jointly connected. Investment in treatment of water and air emissions can result in a higher rate of energy consumption than set by the reference value. The low emissions compensate for the somewhat higher energy consumption.

The point limit, in the cases of both electricity and fuel, is set more stringent for Nordic Swan Ecolabelled paper products (2.3) than the limit set out in the Basic Module (2.5), see also Supplementary Module of Copy and Printing Paper that is also under revision. A somewhat larger number of paper products meet the

requirements of the lower points score level for energy as set out in the Basic Module. Justification here lies in the fact that such paper is approved as raw material for other product groups. For these product groups greater weight, from a life cycle assessment point of view, is placed on other aspects of their environmental impact than the energy consumed in the manufacture of their pulp or paper-based raw materials.

The total energy score calculation has been adjusted. Weighted scores for pulp and paper mills in the total point score calculation have been removed in order to balance the calculations between pulp and paper mills. Pulps dominate the calculations – naturally due to their greater energy use – but also due to weighting in total point score calculations. In order to have focus also on the paper mill, the paper and pulp are no longer weighted in the final calculation. This simplifies the equation presented in chapter 4.2.3 in Appendix 4 in the Basic Module, leading to a subsequent adjustment of the final P_{total} limit values. The same level of flexibility – 25% in the Basic Module – is maintained in version 3. As the calculation has been changed, the numeric values are adjusted, respectively. Since the total energy score requirement is adjusted to have more focus on energy use in paper mill, Nordic Swan Ecolabel requirements on energy are more stringent than EU Ecolabel requirements for printing paper.

Emissions of greenhouse gases

Requirement for emissions of greenhouse gases from paper production has been adjusted. The requirement limits the greenhouse gas emissions of fuels used for production of process heat. Fuel emission factors shall be used in accordance with Annex VI of Commission Regulation (EU) No 601/2012[31], or factors accepted by the authorities in European Union Emissions Trading System (EU ETS) shall be used.

In order to keep global warming below 1.5°C[32], requirements designed to ensure reductions in CO_2 emissions have become increasingly important. Therefore, Nordic Ecolabelling sets a requirement for CO_2 emissions as in previous generations of the criteria. According to Nordic Ecolabelling's general principles the focus in requirements is mainly to limit energy consumption (see previous requirement for energy O9) and promote energy sources with low environmental and climate impact. Since the production of paper consumes large amounts of energy, strict requirements on energy consumption of electricity and fuels are set. The purpose of the requirement on greenhouse gas emissions is to further limit the use of fossil fuels and restrict the use of fuels with the highest greenhouse gas emissions.

In production of pulp and paper, greenhouse gas emissions are mainly generated by the combustion of fuels. The previous requirement for carbon dioxide emissions included emissions from both fossil fuels and electricity. Emissions from electricity were calculated with an emission factor of 385 g CO_2 / kWh, i.e. European electric mix. In this version of the Basic Module, the Swan has chosen to include a CO_2 cut-off level only for fuels used for production of process heat. See also Appendix 1 where Q&As regarding Nordic Ecolabelling requirement for

[31] Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council (OJ L 181, 12.7.2012, p. 30).
[32] https://www.ipcc.ch/

greenhouse gas emissions for paper are presented more closely. After the consultation, a separate requirement for a CO_2 cut-off level has been introduced in the supplementary module for Copy and Printing Paper with stricter limit values than in the Basic Module. As the limit values for energy consumption are stricter in the supplementary module, it is highly justified that also limit values for greenhouse gases are stricter than those set in the Basic Module. To cover whole production, the paper manufacturer of Nordic Swan Ecolabelled paper must also supply calculations of the total emissions of greenhouse gases per tonne paper.

According to a report[33] from the European Commission's Joint Research Centre, the most important action to reduce greenhouse gas emissions from the paper industry is to shift from direct combustion of natural gas, oil and coal to biofuels. The limits set by the requirement are formulated in terms of CO_2 kg/ADt paper. Starting point for setting the limit values has been a well-functioning pulp and paper mill (see reference values for energy in Tables 1 and 2) and assumptions that natural gas instead of other fossil fuels is preferred as fossil fuels in production cannot totally be ruled out today. No specific limits are set as regards types of pulp since the CO_2 impact of pulp is included in calculations by adding the weighted average value for constituent pulps to the total value of CO_2 emissions for the paper product. A weighted threshold value for blends of different types of pulp is calculated upon the basis of the threshold values for chemical pulp, recycled fibre and mechanical pulp. The threshold value of paper made from 50% chemical pulp and 50% mechanical pulp is, for instance, calculated according to the formula 0.5*500+0.5*550 and summed up with paper production. The pulp/paper manufacturer shall submit calculations in accordance with Appendix 4 to demonstrate fulfilment of the requirement. Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

The requirement for emissions of greenhouse gases in the Basic Module applies to inspected paper and other Nordic Ecolabelling criteria which make reference to the requirements set in the Basic Module. In the supplementary modules of paper, there can be stricter and additional requirements for emissions of greenhouse such as in the Criteria for Copy and Printing Paper, where even calculation of greenhouse gas emissions is included.

2.8 Emissions to water and air

The requirements on emissions to water and air are structured in such a way that the paper manufacturer calculates total emissions from pulp and paper production. To do this, the paper manufacturer will need information on the specific emissions from pulp production.

Measured emissions are compared with the reference values for emissions. The reference values can be found in Appendix 5, Table 5.1 in the Basic Module. Reference is made to these in the calculation of emission scores for individual emission parameters. The emission scores for chemical oxygen demand (COD), phosphorus (P), sulphur (S) and nitrogen oxides (NO_X) are summed to a total score. The calculation for paper does not include filler. The emission value that is

[33] Energy Efficiency and GHG emissions: Prospective Scenarios for the Pulp and Paper Industry, http://publications.jrc.ec.europa.eu/repository/bitstream/JRC111652/kjna29280enn_jrc111652_online_revised_by_ipo.pdf

reported is primarily based on measured emissions. Instructions for measuring emissions are found in Appendix 5. Requirements are also imposed on the laboratory, the method of measurement and frequency of measurement.

O11 Emissions of COD, P, S and NOX to water/air

Emissions to air and/or water from the production of pulp and finished paper must be specified in terms of emissions points scores for each of the four parameters (P_{COD}, P_P, P_S, P_{NOx}) according to the following. The measured emissions shall be compared to reference values relating to specific production methods (Appendix 5, Table 5.1).

The individual point score for P_{COD}, P_P, P_S, and P_{NOx} must not exceed 1.3.

The total emissions score, $P_{emissions\_total}$:

$P_{emissions\_total} = P_{COD} + P_P + P_S + P_{NOx}$ may not exceed 4.0.

The paper manufacturer shall submit calculations in accordance with Appendix 5 to demonstrate fulfilment of the requirement. Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

Background to requirement

The requirement regarding emissions to water and air has been made more stringent. Limit value for individual point score has been changed from 1.5 to 1.3. Some reference values have been tightened, see closely Table 3.

The most important emissions from pulp and paper mills have been collected in the environmental matrix. As previously, these parameters are chemical oxygen demand (COD) and phosphorus (P) to water, and sulphur (S) and nitrogen oxides (NOx) to air. Actual measurements are compared to reference values in the matrix. One point is awarded in the matrix if emissions are measured at the same level as that given in the reference value. If the emissions are recorded at a lower level than the reference value, the points score is < 1. If emissions are higher than allowed by the reference value, the points awarded will be >1. No product receiving a point score above 1.3 will be permitted to carry the Nordic Swan Ecolabel. This point score corresponds to the same level as introduced in the EU Ecolabel's recently published Criteria for Graphic Paper[34]. The grand total score corresponds to all emission points when added together and shall not exceed 4.

Table 3 Reference emission values (kg/ADt) for pulp types and paper manufacture. For comparison, reference values in the current Basic Module (BM), version 2 and in the EU Ecolabel criteria (EU) for graphic paper published in January 2019 are shown.

Pulp type ($pulp_i$) or paper	CODref BM3/BM2/EU	Pref BM3/BM2/EU	Sref BM3/BM2/EU	NOXref BM3/BM2/EU
Bleached chemical pulp (sulphate and other pulps except sulphite pulp)	15/18/16	0.025(0.08)/0.03/0.025 (0.09)[l]	0.35/0.6/0.35	1.5/1.5/1.6
Bleached chemical pulp (sulphite pulp)	23/25/24	0.03/0.03/0.04	0.5/0.6/0.75	1.5/1.5/1.6
Magnefite pulp	27/28	0.04/0.056	0.5/0.75	1.5/1.6
Unbleached chemical pulp	6.5/10/6.5	0.016/0.2/0.016	0.35/0.6/0.35	1.5/1.5/1.6

[34] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0070&from=EN

CTMP pulp	15/15/16	0.008/0.01/0.008	0.15/0.2/0.20	0.25/0.25/0.25 (0.7)[I][V]
TMP/Groundwood	3(5.0)/3/3 (5.4)[II]	0.008/0.01/0.008	0.15/0.2/0.20	0.25/0.25/0.25
Recycled fibre pulp	2/3/2.4[III]	0.007/0.01/0.008	0.2/0.2/0.20	0.25/0.25/0.25
NSSC	8/-/-	0.02/-/-	0.4/-/-	1.5/-/-
Paper/board machine, uncoated	1/2/1	0.007/0.01/0.008	0.2/0.3/0.3	0.6/0.7/0.7
Paper/board machine, coated	1/2.5/1	0.007/0.01/0.008	0.2/0.3/0.3	0.6/0.7/0.7
Paper machine, special paper	3/3.8/-	0.02/0.02/-	0.5/0.5/-	0.7/0.7/-

[I] Reference value for eucalyptus pulps
[II] COD value in parentheses is for highly bleached mechanical pulps
[III] Recycled fibre pulp with deinking in the EU Ecolabel Criteria
[IV] From non-integrated CTMP mills using flash-drying of pulp with biomass-based steam in the EU Ecolabel Criteria

The reference values for COD, P, and S have been made more stringent in this revision. The reference values are based upon BAT report[35], published data available[36] and supplemented by a review of currently held Nordic Ecolabelling's licences and data gathered from paper used in Nordic Swan Ecolabelled printing matter. Depending on the pulp, reference values set by Nordic Ecolabelling are more stringent or on the same level as those set by the EU Ecolabel. Regarding e.g. the chemical pulp widely used in paper products, new reference values set by Nordic Ecolabelling are 13 kg/tonne for COD, 0.02 for P, 0.3 for S and 1.5 for NOx whereas corresponding values set by EU Ecolabel are 16, 0.025/0.09, 0.35 and 1.6 kg/tonne, respectively.

O12 Chlorine gas bleaching

Pulps used in Nordic Swan Ecolabelled paper must not be bleached using chlorine gas. The residual quantities created during the production of chlorine dioxide from chlorate are not defined as a component of chlorine gas bleaching.

The pulp manufacturer shall certify that chlorine gas is not used for bleaching the pulp.

O13 Emissions of chlorate

Chlorate emissions from chemical pulp production must be measured and reported to Nordic Ecolabelling annually.

Measurements are not required if chlorine dioxide is not produced at the pulp mill or if the wastewater from chlorine dioxide production is dealt with anaerobic treatment (chlorate reduced).

The pulp manufacturer shall display results of measurements or declarations/certificates supporting the two latter points.

Background to requirements

The requirements for chlorine gas bleaching (O12) and emissions of chlorate (O13) are unchanged. Requirement for emissions of chelating agents

[35] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:JOL_2014_284_R_0017
[36] https://www.skogsindustrierna.se/skogsindustrin/branschstatistik/miljodatabas/

EDTA/DTPA in version 2 of the Basic Module has been removed, see closely chapter 4 Changes compared to previous version.

O14 AOX

The weighted average value of AOX released from the pulps used in the Nordic Swan Ecolabelled paper product must not exceed 0.14 kg/tonne paper. AOX emissions from each individual pulp used in the paper must not exceed 0.16 kg/ADt.

- AOX emissions from each pulp documented by **the pulp manufacturer**. The pulp mill shall send information on emissions measured as kg/ADt to the paper manufacturer and directly to Nordic Ecolabelling.

- **The paper manufacturer** shall use the spreadsheet provided by Nordic Ecolabelling.

Background to requirement

The AOX requirement has been tightened. The weighted average value of AOX released from the pulps used in the Nordic Swan Ecolabelled paper product has been changed from 0.17 to 0.14 kg/ ADt. AOX emissions from each individual pulp used in the paper must not exceed 0.16 kg/ADt (previously 0.25 kg/tonne).

The production of elemental chlorine-free (ECF) bleached pulp leads to emissions of absorbable organically bound halogens (AOX). The AOX value gives an indication of, among other things, the relative effectiveness of the waste treatment and purification processes, as well as the quantities of chlorine dioxide used in the bleaching process; i.e. the lower the emissions of AOX the more efficient the waste treatment process and the lower the quantities of bleaching chemicals used in the pulp mill.

The AOX requirement has been tightened compared to version 2. The new requirements are based upon BAT reference values and supplemented by a review of currently held Nordic Ecolabelling's licences and data gathered from paper used in Nordic Swan Ecolabelled printing matter. In version 2 of the Basic Module, Nordic Ecolabelling introduced a uniform method of calculation and uniform limits for AOX emissions for all paper products. This means that these will apply to e.g. tissue paper products when those criteria are next revised.

2.9 Waste

O15 Waste

The pulp/paper manufacturer must specify that all waste types generated in the factory area are sorted at source and the various waste fractions shall be recycled or reused to as great extent as possible. The waste fractions and the way in which they are processed shall be reported.

The applicant must state if the waste is classified as environmentally hazardous in accordance with national legislation.

If the pulp/paper mill is certified according to ISO 14001 or registered with EMAS, no documentation is necessary if waste management in the production site is included within the certification/reporting system.

The pulp /paper manufacturer must account for the following:

- How sorting at source is carried out.
- Sorting fractions
- How the individual fractions are handled (internal or external reuse, recycling, energy use, landfilling or other).
- Annual quantity of the different fractions. The quantities can be calculated for a shorter period and converted to annual figures.

If pulp/paper mill is certified according to ISO 14001 or registered with EMAS, a valid certificate covering the production site shall be enclosed.

Background to requirement

The requirement has been amended, but the ambition level of the requirement remains the same as in the previous version. The requirement aims to reduce the amount of waste generated during production of pulp and paper. Pulp and paper manufacturers must have a waste management system in place including waste separation, reuse and recycling.

Analysis of Nordic Ecolabelling licences and data gathered from paper used in Nordic Swan Ecolabelled printing matter showed that all pulp and paper mills have well-functioning waste treatment and disposal systems. The majority are certified according to some sort of environmental management system that includes waste management. Therefore, no documentation is required if the production site is certified according to ISO 14001 or EMAS.

2.10 Annual reporting

O16 Annual follow-up

The pulp manufacturer shall on an annual basis report the specific emissions for production and energy consumption.

The paper manufacturer shall report pulps and chemicals used in production.

This information shall be submitted by 1 April at the latest during the licence period or so long as the pulp/paper is used in Nordic Swan Ecolabelled products.

Nordic Ecolabelling may examine a selection, or all, of the requirements. Nordic Ecolabelling maintains the right at any time to request further information, such as details of energy consumption. Changes affecting the ecolabelling requirements must be reported over and above the annual follow-up. Refer to the section on quality assurance.

Annual reporting according to above in the web-based application tool.

Background to requirement

The requirement has been changed. Regarding paper manufacturers, requirement to report annually emissions and energy has been removed. Paper producers shall only report the pulps and chemicals used. This is to ensure that changes in production, which may affect the product's ability to fulfil the ecolabelling requirements, are reported to Nordic Ecolabelling. Nordic

Ecolabelling maintains the right at any time to request further information, such as details of emissions and energy consumption.

For the pulp producer, the level of reporting emissions and energy use remains the same as in the previous version. This up-to-date information is relevant for the paper producers to verify that the paper complies with the requirements set by Nordic Ecolabelling. The obligation to send in a list of used chemicals has, however, been removed in order to lessen the heavy reporting burden.

3 Areas that are not subject to requirements

This section presents requirements that are not included in the criteria, but which were discussed during the development of the criteria.

Product Environmental Footprint (PEF)

Within the EU, there has been a project to develop Final Product Environmental Footprint Category Rules (PEFCRs) and Organisation Environmental Footprint Sector Rules (OEFSRs) that can be used for calculating the Environmental Footprint profile for products and organisations in scope.[37] Product Environmental Footprint (PEF) Category Rules have been introduced for Intermediate paper product[38]. Possibilities to use PEF in the Nordic Ecolabelling Criteria have been discussed during the revision work but was considered too early at this stage and is thus, not subject to requirements in the generation 3 of the Basic Module. Nordic Ecolabelling will follow with interest the possibilities to use PEF in the next generation of the Basic Module.

4 Changes compared to previous generation

Overview of changes to Criteria for Copy and Printing paper, generation 5 including the Basic and Chemical Module compared with previous generations is presented more closely in Table 1 of the background document for the Criteria for Copy and Printing Paper. Comparison of Nordic Swan Ecolabel and EU Ecolabel requirement levels for graphic paper is also included in the table.

Some requiremements have been removed from generation 5 of the criteria. These requirement for transport and for chelating agents are presented shortly below. Changes regarding requirements in the Chemical Module are presented more closely in Appendix 2.

Transportation and distribution

A requirement for transportation (O11) was introduced in version 2 of the Basic Module. The requirement was applied only to Nordic Swan Ecolabelled paper. The paper manufacturer shall supply calculations of the total CO_2 impact of all forms of transport from the forest to the paper mill. This requirement has been removed due to low potential to gain environmental benefits. Refer to background document of the Criteria for Copy and Printing Paper which is also currently under review.

[37] http://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm
[38] http://ec.europa.eu/environment/eussd/smgp/pdf/PEFCR_intermediate_paper_product.pdf

Chelating agents

In the previous versions of the Basic Module, there was requirement O15 for emissions of not readily biodegradable organic chelating agents such as EDTA or DTPA. The requirement has now been removed from generation 3 of the Basic Module. According to the recent BAT conclusions[39], BAT is to use a combination of the techniques to reduce the release of these organic chelating agents to the environment. As the Nordic Swan Ecolabel requirement is now covered by legally binding BAT conclusions, the requirement has been removed from the Basic Module. However, to reduce the release of not readily biodegradable organic chelating agents such as EDTA or DTPA, techniques in line with Best Available Techniques (BAT) Reference Document for the Production of Pulp, Paper and Board is to be used. This has been included in requirement for chemicals (O8) as there may be pulp and paper mills outside Europe.

[39] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0687&from=EN

Appendix 1 Q & A: Nordic Ecolabelling requirements for greenhouse gas emissions for paper

The Nordic Ecolabelling, wishes a transition towards 100 % renewable energy, including electricity.

Our general principles for setting requirements for energy use and greenhouse gas emissions from energy are:

- Limiting the energy consumption
- Promoting energy sources with low environmental and climate impact.

1. What has been changed in the greenhouse gas requirement for paper, and why?

In the Nordic Ecolabelling criteria for paper, the requirement for greenhouse gas emissions has previously included emissions from both fuels and electricity. Emissions from electricity were calculated with an emission factor of 385 g CO_2/kWh, i.e. European electricity mix. In this generation 3 of the Basic Module, the Nordic Swan Ecolabel has chosen to let the greenhouse gas requirement only cover emissions from fuels.

A requirement that covers both fuels and electricity, has a higher uncertainty in the calculation, and it becomes more difficult to encourage the actions that lead to the greatest environmental benefit in the short term. In addition, the emission factor for electricity is debated. Different emission factors can lead to different undesired effects, for example that natural gas is favoured, instead of electricity. The Nordic Ecolabelling assesses that a requirement that only limits the emissions from fuels leads to the largest direct environmental benefits.

According to a report[40] from the European Commission's Joint Research Centre, the most important action to reduce greenhouse gas emissions from the paper industry is to shift from direct combustion of natural gas, oil and coal to biofuels. Conversion from fossil-based electricity is of course also important, but the Nordic Ecolabelling considers that this is currently beyond the control of the paper producer (see question 3). The most effective way of reducing the environmental impact from electricity is to keep the electricity consumption low, which is done according to requirement O9 in the Criteria.

2. How does Nordic Ecolabelling limit greenhouse gas emissions from electricity while "green electricity" is not promoted in the greenhouse gas requirement?

The Nordic Ecolabelling believes that the most effective way of limiting greenhouse gas emissions from electricity is to keep the consumption of electricity low.

[40] Energy Efficiency and GHG emissions: Prospective Scenarios for the Pulp and Paper Industry, http://publications.jrc.ec.europa.eu/repository/bitstream/JRC111652/kjna29280enn_jrc111652_online_revised_by_ipo.pdf

The Nordic Ecolabelling assesses that purchasing “green electricity” currently does not lead to increased production of electricity from renewable resources or a decreased production of electricity from fossil fuels (see question 3).

3. Why does the Nordic Ecolabelling not promote ”green electricity” in the criteria for paper?

So-called green electricity can be booked and claimed by using guarantees of origin. Guarantees of origin are electronic documents which are traded in an open market and guarantee that the same amount of renewable electricity that is bought, has earlier been produced. The system prevents that the electricity can be sold as renewable several times. However, the electricity that you physically get is produced from a mix of renewable and fossil sources regardless of whether you purchased renewable electricity or not.

This far, the price of the guarantees of origin has been so low that the system has not functioned as a tool to increase renewable electricity production. Other factors as political measures, electricity price, etc. have had a greater importance for the increase of renewable electricity. The Nordic Ecolabelling considers that the positive effect from guarantees of origin is currently very small, and consequently, we have chosen not to promote green electricity in the greenhouse gas requirement of paper.

In addition, requirement including green electricity is complicated since the criteria must work in the whole world, regardless of where the mill is located. Guarantees of origin are currently limited to Europe.

4. Why is the requirement of the Nordic Swan Ecolabel different from the EU Ecolabel?

The greenhouse gas requirement in the EU Ecolabel Criteria for Graphic Paper covers emissions from both fuels and electricity. The emissions for grid electricity are calculated with the factor 384g CO2/kWh in accordance with the MEErP methodology [41]. If the paper mill purchases green electricity (with guarantees of origin) it can use the specific emission factor given by the electricity supplier. The requirement will promote the purchase of green electricity.

However, The Nordic Ecolabelling assesses that purchasing of green electricity currently does not contribute to increased amount of renewable electricity in the actual electricity system (see question 3). This type of combined greenhouse gas requirement for fuels and electricity may lead to purchasing of green electricity instead of reducing combustion of fossil fuels. The Nordic Ecolabelling instead focuses on reducing the consumption of electricity, which leads to direct environmental benefits.

5. How large is the carbon footprint from the Nordic Swan Ecolabelled paper compared to other paper?

The Nordic Ecolabelling wants to ensure a significant reduction in greenhouse gas emissions from pulp and paper. Since the production of paper consumes large amounts of energy, strict requirements on energy consumption of electricity and fuels are set. The purpose of the requirement on greenhouse gas emissions is to

[41] Methodology for the Ecodesign of Energy-related Products.

further limit the use of fossil fuels and restrict the use of fuels with the highest greenhouse gas emissions.

Greenhouse gas emissions occur during the whole life cycle of the paper – during cultivation, transportation, production, waste management etc. However, Nordic Ecolabelling does not set requirements in all phases of the life cycle (see question 6), but rather where we can achieve the largest environmental benefit.

6. Why is there no requirement for a total carbon footprint for Nordic Swan Ecolabelled paper?

The Nordic Swan Ecolabel wishes to set requirements that reduces the greenhouse gas emissions and that leads to a direct environmental benefit. Calculations of carbon footprint are a step towards acting, but do not in themselves provide any environmental benefit. Nordic Ecolabelling instead focuses on those measures that give the largest direct effect on the reduction of greenhouse gas emissions.[42]

Many companies calculate the greenhouse gas emissions of their products and services but there is not yet a harmonised, mandatory calculation method. The EU Commission has initiated an extensive work to develop Product Environmental Footprint (PEF) which will hopefully result in more harmonised documentation of a product's carbon footprint.

7. Nordic Ecolabelling has a limit for the total carbon footprint for biofuels. Why not for paper?

For biofuels, the Nordic Ecolabelling uses the calculation methodology laid down in the Renewable Energy Directive (2009/28/EC), which the entire biofuel sector must follow. Such an accepted method is lacking to calculate the carbon footprint from the entire life cycle of the paper.

8. Will Nordic Ecolabelling set requirements on the paper's total carbon footprint in the future?

Nordic Ecolabelling follows the development of the European Commission's work on PEF. To be able to set requirements on the paper's total carbon footprint, a harmonised method is required.

[42] Energy Efficiency and GHG emissions: Prospective Scenarios for the Pulp and Paper Industry, http://publications.jrc.ec.europa.eu/repository/bitstream/JRC111652/kjna29280enn_jrc111652_online_revised_by_ipo.pdf

Appendix 2 Justification of the requirements in the Chemical Module

The chemical requirements apply to **production chemicals** used in the production of pulp and paper and to **chemicals used in the conversion of the paper**. The requirements are applied regardless of the manufacturing method.

Many production chemicals are used in the manufacture of pulp and paper products. These may be categorised into process chemicals for pulp production as well as chemical products used during production. It can refer to chemical additives and auxiliary chemicals for paper production. The term "production chemicals", as used in this document, is a collective term for chemical additives, auxiliary chemicals and process chemicals. The term is further used to refer to starch, filler material and so on.

The requirements do not apply to the chemicals listed in Table 2 in Appendix 1 of the Chemical Module. These include e.g.:

- Ordinary pulp cooking and bleaching chemicals, including process chemicals produced on-site.
- Mineral chemicals used as fillers or coating on paper or in wastewater treatment.

Furthermore, the requirements do not apply to chemicals used for:

- Treatment of raw water
- Energy production such as chemicals used in treatment of cooling water and boiler water
- Maintenance during production stops. Chemicals as felt washing agents used continuously in production are, however, regarded as production chemicals.
- Wastewater treatment lying outside the control of the pulp or paper manufacturer, as a treatment done by an external part such as municipal wastewater treatment plants. Chemicals used in external water treatment plants operated by the pulp or paper manufacturer are not exempted from the requirements, see also external/internal water treatment in the list of definitions.
- Trials in pulp and paper manufacturing for no longer than 10 days during a period of, at most, two months.

7.1 Definition of ingoing substances and impurities

Ingoing substances and impurities in chemical products are defined below, and apply to all requirements in the Chemical module unless stated otherwise in the requirements:

- **Ingoing substances:** All substances in the chemical product, including additives (e.g. preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g.

formaldehyde and arylamine) are also regarded as ingoing substances.

- **Impurities:** Residuals, pollutants, contaminants etc. from production, including production of raw materials that remain in the chemical product in concentrations less than 1000,0 ppm (0,1000 w-%, 1000,0 mg/kg).

Examples of impurities are residues of the following: residues or reagents incl. residues of monomers, catalysts, by-products, scavengers, and detergents for production equipment and carry-over from other or previous production lines.

The manufacturer or supplier of the chemical product must demonstrate compliance with the requirements in the Chemical Module. Fulfilment of the requirements is documented primarily with the aid of declarations or test results from chemical manufacturers/suppliers. Declarations are to be submitted with the aid of the web-based application tool.

Nordic Ecolabelling has the right to request chemical manufacturers/suppliers for further information on production chemical when necessary, in order to check the contents of the product.

The chemical supplier must inform Nordic Ecolabelling in the event of any change to the composition of the product, that impacts the product's fulfilment of the requirements.

7.2 Definitions

Term	Definition or explanation
Azo dyes	Azo dyes, which by reductive cleavage of one or more azo groups may release one or more of the aromatic amines listed in Regulation (EC) No 1907/2006 Annex XVII, Appendix 8.
Chemical	Please see "Production chemical".
Chemical product	Please see "Production chemical".
Dye	Colourant substance that is dispersed in a medium in which it is soluble. Used as colourant in paper colourants. This definition is based on EuPIA:s definition[43].
External wastewater treatment	External water treatment plant is the plant on site where wastewater is treated before discharge to recipient. This is not to be mixed with wastewater treatment done by an external part such as municipal wastewater treatment plant. See also internal water treatment.
Impurities	Residuals, pollutants, contaminants etc. from production, including production of raw materials that remain in the chemical product in

43 https://www.eupia.org/fileadmin/user_upload/181031_Standard_Glossary_of_Food_Contact_Material_Inks_and_Coatings_Terms.pdf

	concentrations less than 1000,0 ppm (0,1000 w-%, 1000,0 mg/kg). Examples of impurities are residues of the following: residues or reagents incl. residues of monomers, catalysts, by-products, scavengers, and detergents for production equipment and carry-over from other or previous production lines.
Ingoing substances	All substances in the chemical product, including additives (e.g. preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g. formaldehyde and arylamine) are also regarded as ingoing substances.
Internal water treatment	Internal water treatment means processes on site where process water is treated between different processes and thereafter water is recycled within the production plant. See also external wastewater treatment.
Microplastics	Microplastic means particles with a size of below 5 mm of insoluble macromolecular plastic, obtained through one of the following processes: (a) a polymerisation process such as polyaddition or polycondensation or a similar process using monomers or other starting substances; (b) chemical modification of natural or synthetic macromolecules; (c) microbial fermentation.
Nanomaterials/-particles	Nanomaterials/-particles are defined according to EU commission recommendation on the definition of nanomaterial (2011/696/EU)[44]: Nanomaterial' means a natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50 % or more of the particles in the number size distribution, one or more external dimensions is in the size range 1 nm-100 nm
Naturally occuring inorganic minerals	Mineral chemicals used in the production of pulp and paper, e.g. as a filler or as a coating or in wastewater treatment. Applies to naturally occurring inorganic minerals as defined in Annex V, clause 7 of REACH. Examples are bentonite, calcium carbonate, kaolin and talc.
Paper colourants	Product sold by a manufacturer that is used for printing, dyeing, shading or colouring of paper or pulp.
Pigment	Organic or inorganic substances dispersed in a medium, in which they are insoluble. They are used as colourants in paper colourants. This definition is based on EuPIA:s definition. (See footnote 34.)

[44] https://eur-lex.europa.eu/legal-content/SV/TXT/PDF/?uri=CELEX:32011H0696&from=EN

Production chemical	The term production chemical, as used in this document, is a collective term for chemical products used during production. It can refer to chemical additives, auxiliary chemicals and process chemicals.
Raw material	In the Chemical Module, raw material refers to ingoing raw materials in production chemicals.
Sizing	Sizing means the process of increasing the paper's resistance to the penetration of liquids such as inks or to increase the surface strength of paper. Starch is for example one of the most commonly used materials for sizing
VOC	Volatile organic compounds are defined in accordance with the 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.

7.3 Justification of the requirements

According to Nordic Ecolabelling's overall principles, the Nordic Swan Ecolabel must be a powerful tool that works to phase out substances that are hazardous for the environment and health. The vision is for Nordic Swan Ecolabelled products not to contain prioritised substances that are hazardous for the environment and health. Prioritised substances are e.g. substances that are classified as CMR or environmentally hazardous and which are persistent, bioaccumulative and toxic (PBT substances) and/or very persistent and very bioaccumulative (vPvB substances). The precautionary principle is the starting point when substances are suspected of having serious environment and health characteristics. Official regulations (classification, labelling, official lists and regulation) are used to exclude substances and products that are hazardous for the environment and health in the criteria. As the Nordic Swan Ecolabel is an ecolabel, the requirements in the criteria are more stringent than legislation. This entails that the chemical may be prohibited from Nordic Swan Ecolabelled paper, even though it is permitted under the authorities' regulations.

The chemical requirements in the Chemical Module of paper products is formulated with the primary objective of limiting and reducing environmental impact, but consideration is also taken to the health hazards involved in handling chemicals. Quantities of production chemicals often appear to be relatively small compared to the total amount of pulp or paper produced. However, each year, millions of tonnes of pulp and paper products are manufactured, which means that a considerable quantity of chemicals is used worldwide. The properties of these chemicals, in relation to their effects on the environment, are, therefore, of major significance.

Efforts are being made across the EU to phase out the use of harmful chemicals. Pulp and paper manufacturers purchase products from a wide range of suppliers of chemicals. These suppliers are often able to offer, or develop, alternative products if there is a demand for them. Experience from the ecolabelled products such as tissue paper and printing paper has shown that it may be relatively simple to substitute chemicals that are harmful to health and the environment

with less hazardous alternatives. Nordic Ecolabelling, in this way, steers production towards the use of chemical products that are less harmful to health and the environment. Chemical requirements set by Nordic Ecolabelling also contribute to the development of the chemical industry for more sustainable products and production and thus, contribute to reaching the UN Sustainable Development Goal[45] 3 and goal 14 Life below water.

Evaluating the environmental hazards associated with different chemicals can be a difficult task for those with responsibility for production. In such cases, Nordic Ecolabel requirements can help those charged with responsibility for environmental issues to select production chemicals with a lower negative impact on the environment. EU directives apply only to articles and goods sold or produced within the EU, but Nordic Ecolabelling accepts applications for licences to carry the Nordic Ecolabel from across the world; and, thus, the reach of Nordic Ecolabelling requirements extends to pulp and paper production beyond the boundaries of the EU.

7.4 Requirements applicable to all production chemicals

The Nordic Ecolabelling's general requirements O1 and O2 are applied to all production chemicals used in production of pulp and paper.

The chemical manufacturer or supplier must demonstrate compliance with the requirements by duly completing each declaration in the web-based application tool.

O1 Classification of production chemicals

Production chemicals classified according to the risk phrases indicated in the table below must not be used in pulp and paper manufacture.

Table 4 Classification of production chemicals

Classification under CLP Regulation (EC) No 1272/2008		
Classification	**Hazard Class and Category Code**	**Hazard statement**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1–3	H400 H410, H411, H412
Hazardous to the ozone layer	Ozone	H420
Acute toxicity	Acute Tox. 1, 2	H330, H310, H300
Specific target organ toxicity	STOT SE 1	H370
Carcinogenic*	Carc. 1A/1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A/B Muta. 2	H340 H341
Reproductive toxicity*	Repr. 1A/1B Repr. 2	H360, H361 H362

** The classifications concern all classification variants. For example, H350 also covers classification H350i.*

[45] https://sustainabledevelopment.un.org/sdgs

This requirement applies to production chemicals and not ingoing substances, see Definitions. The manufacturer of the chemical product is responsible for its' classification.

Please note that requirement O2 below applies to all production chemicals and may incur further restrictions.

Exemptions to the requirement are the following:

- Biocidal products. Please note that there is a separate requirement, O5, for biocidal products that may restrict their use further.
- Chemical products classified as Aquatic Chronic 3 H412 are exempted if classification is due to the presence of in-can preservatives.
- Peracetic acid (bleaching agent)
- Cationic polymers, if charge is the reason for classification.

Paper colourants classified as environmentally hazardous are exempted from the requirement if:

- classification of the paper colourant is due to the dye/pigment itself

and

- dyes/pigments are fixed to fibres > 98%. The degree of fixation is calculated as the total retention of dyes / pigments on the fibres during the process

The chemical manufacturer/supplier must demonstrate compliance with the requirement by duly completing the declaration in web-based application tool.

The chemical manufacturer/supplier must enclose safety data sheet in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC) for all chemical products.

If the exemption to paper colourants is applied, the chemical manufacturer/supplier and **pulp/paper producer** must verify how the requirements for the exemption are met by duly completing and signing Appendix 10 (chemical manufacturer/supplier) and Appendix 13 (pulp/paper producer) in the web-based application tool.

Background to requirement

The requirement for classification of production chemicals has been amended. A new classification category has been introduced in the requirement, namely

- Aquatic chronic 3: H412

Nordic Ecolabelling aims for the health and environmental impacts of chemical products used 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, or hazardous for the environment must not be used in the manufacture of the Nordic Swan Ecolabelled paper products.

The list of exemptions has been adjusted. Some exemptions have been removed such as consumption of chemicals in low quantities (0.05 kg/tonne product) that was applied to the pulp and paper producer, see closely chapter 7.5 Changes compared to previous generation. Regarding paper colourants, the reference to lists of restricted substances database (Sweden) or undesirable substances[46] or Priority list[47] have been removed as these substances are included in the new requirement for exclusion list (O2) below.

Some new exemptions have been added to the requirement. Chemical products classified as Aquatic Chronic 3 H412 are exempted if their classification is due to the presence of in-can preservatives. This exemption is mainly due to ATP 13 of the CLP coming into force on May 2020, which implements a new factor for CMIT/MIT. Isothiazolinones are effective preservatives at low concentrations. However, they are sensitising, and there has been ongoing discussion within the EU concerning limitation of MI (methylisothiazolinone) in particular (CAS 2682-20-4).

The classification requirement concerns chemical products used in the production of pulp and paper. The requirement is, however, not applied to ordinary chemicals such as inorganic cooking chemicals (such as NaOH, Na_2S), inorganic bleaching chemicals (such as H_2SO_4, SO_2) or mineral chemicals such as kaoline, clay or calcium carbonate ($CaCO_3$) used as fillers or coating on paper. The full list of these chemicals can be found in Appendix 1 to the Chemical Module. Bulk chemicals may be present in large quantities, and play a vital role in paper production, while not posing the most significant risks to the environment. These chemicals may be classified as environmentally hazardous or very toxic at high concentrations, inter alia due to high alkalinity. A requirement with respect to classification (O1) of these chemicals is not deemed to be of benefit to the environment.

Some chemicals listed in Table 2 in Appendix 1 do however pose risks to the environment and to health but are nonetheless exempted from the requirements due to their necessity in the production of pulp and/or paper. An example of this is DTPA, which is classified as a category 2 reprotoxicant suspected of damaging fertility or the unborn child. DTPA is crucial in the bleaching stage of pulp production as other, less harmful complexing agents are currently not strong enough to bind metals effectively in the bleaching process. Please note that according to the recent, legally binding, BAT conclusions[48], mills are to use a combination of techniques to reduce the release of organic chelating agents, such as DTPA but also EDTA, to the environment. This is specifically handled in requirement O8 in the Basic Module.

Bulk chemicals may, of course, constitute a hazard in the workplace if handled without due care and attention, but requirements placed on workplaces by the

46 http://www.mst.dk/Virksomhed_og_myndighed/Kemikalier/Stoflister+og+databaser/listen_over_uoenskede_stoffer/

47 http://www.miljostatus.no/Tema/Kjemikalier/Kjemikalielister/Prioritetslisten/

48 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0687&from=EN

authorities are considered by Nordic Ecolabelling to constitute sufficient regulation.

O2 Prohibited substances

The following substances must not be ingoing substances in chemical products used in the production of pulp and paper. For definition of ingoing substances and impurities, please refer to the beginning of this chapter.

- CMR substances – Carcinogenic, Germ cell mutagenicity, Reproductive toxicity category 1 A/B or category 2

An exemption is made for titanium dioxide (CAS no. 13463-67-7), if it is in non-dusting form.

Dichloroisopropanol (DCP) and chloropropanediol (CPD) formed from epichlorohydrin (ECH) in wet strength agents are exempted from this requirement. However, please note that these substances are further restricted in requirement O7.

- Substances on the Candidate List*
- Substances that have been judged in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)***
- Nanomaterials/-particles

*An exemption is made for pigments, naturally occurring inorganic fillers, nanocellulose, synthetic amorphous colloidal silica***, and polymer dispersions. Please note that this exemption does not apply to nano-titanium oxide.*

- Microplastics****
- Endocrine disruptors according to the following:
    - Substances that are considered to be potential endocrine disruptors in category 1 or 2 on the EU Commission's priority list of substances that will be further assessed for endocrine disrupting effects. https://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf (Appendix L, page 238 onwards)
    - Substances on the EU Member State Initiative "Endocrine Disruptor Lists", List I and List III. https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu and https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

** The Candidate List can be found on the ECHA website: http://echa.europa.eu/candidate-list-table*

*** PBT and vPvB in accordance with the criteria in Annex XIII of REACH*

**** This applies to synthetic amorphous colloidal silica (either unmodified and modified with aluminium/alumina and/or boron or dimethyl siloxane polymer). Other modifications can be approved after assessment by Nordic Ecolabelling.*

***** Please note that Nordic Ecolabelling is following the ECHA restriction proposal and its definition and reserve the right to change the definition above*

when the definition used in the restriction proposal is finalized. An appropriate transition period would be granted.

The chemical manufacturer/supplier must demonstrate compliance with the requirement by duly completing the declaration in Appendix 2 in the web-based application tool.

Background to requirement

The requirement is new in the Chemical Module.

There are several problematic substances that are difficult to exclude through general requirements concerning the product's chemistry. Nordic Ecolabelling has compiled a requirement covering substances with certain classifications, characteristics or adherence to lists (e.g. the Candidate List) that must not be added to chemical products. The aim of the list is to prohibit substances that are not excluded from use via other requirements, but that are associated with environmental and health risks. There are some double requirements in the list above, for example, certain CMR substances are also SVHC substances.

Definition of ingoing substances, limit value for impurities

The limit value for impurities in accordance with Nordic Ecolabelling's definition of ingoing substances has been raised from 100 ppm, which was the suggested limit in the consultation proposal, to 1000 ppm in Generation 3. The majority of consultation responses noted that a limit of 100 ppm in combination with the new requirement O2 would not be possible to adhere to due to the lack of information of all of the substances listed in requirement O2 as impurities in amounts as low as 100 ppm. It was suggested that the limit value should be harmonized with the reporting limit of REACH at 0.1 w%, which would also entail a harmonization with the corresponding requirement of the EU Ecolabel.

Nordic Ecolabelling conducted a general evaluation of the limit value for impurities in the definition of ingoing substances. The conclusion was that the limit value can be raised to 1000 ppm for specific product groups where the requirement is on a chemical product used in the production of a Nordic Ecolabeled solid article such as copy and printing paper.

Candidate List and SVHC, Substances of Very High Concern

SVHC, Substances of Very High Concern, is a term to describe the substances which fulfil the criteria in article 57 of the REACH Regulation, which states: substances which are CMR (categories 1A and 1B in accordance with the CLP Regulation), PBT substances, vPvB substances (see the section below) and substances which are endocrine disruptors or environmentally hazardous without fulfilling the requirements for PBT or vPvB. SVHC can be included on the Candidate List for later admission to REACH Annex XIV or XVII. On the basis of these adverse characteristics, Nordic Ecolabelling prohibits substances on the Candidate List.

CMR substances are partly restricted via the requirement for classification of chemical products (O1) and via the Candidate list, but CMR substances are nonetheless included as a separate item on the list of prohibited substances, in order to make it very clear that they are prohibited.

Residual monomers

Requirement R6 in generation 2 of the Chemical Module set strict requirements on the content of residual monomers in specific production chemicals such as coating chemicals, retention agents, flocculants, foam inhibitors/ defoamers and wet strength agents. Requirement for residual monomers in R6 in Generation 2 of the Chemical Module has been removed and instead residual monomers on the Candidate List and those classified as CMR are covered by requirement O2. This also means that there is no longer requirement on residual monomers classified as e.g. environmentally hazardous.

In the generation 2, the limit value for monomer acrylamide in the dry matter content of polyacrylamide was set to 700 ppm. Acrylamide is classified as a CMR substance and is also listed on the Candidate List and thus, is now covered by the requirement O2 with a limit value for impurities of 1000 ppm. The limit value for acrylamide as a residual monomer in polyacrylamide products is thus raised from 700 ppm to 1000 ppm. The reason for this is to harmonize this limit value with that of all other substances now that the limit value is raised to 1000 ppm, as well as harmonizing this requirement with that of the EU Ecolabel, which removed its separate requirement of a 700 ppm limit for acrylamide in its new criteria for Graphic paper, tissue paper and tissue products published on 11th of January 2019[49].

PBT and vPvB

Nordic Ecolabelling's vision is for Nordic Swan Ecolabelled products not to include prioritised substances that are hazardous for health and the environment. Prioritised substances are e.g. substances that are persistent, bioaccumulative and toxic (PBT substances) and/or very persistent and very bioaccumulative (vPvB substances).

PBT and vPvB are defined in Annex XIII of REACH (Regulation no. 1907/2006)[50]. Nordic Ecolabelling therefore sets the requirement that chemical substances with these problematic characteristics must not be included in chemical products used in the production of pulp and paper.

Nanomaterials/-particles

Due to their small size and high surface area, nanoparticles are usually more reactive and may have other properties compared to larger particles of the same material. There is concern among public authorities, environmental organisations and others about the lack of knowledge regarding the potential detrimental effects on health and the environment. The Nordic Ecolabel takes the concerns about nanomaterials seriously and uses the precautionary principle to forbid nanomaterials/-particles in the products. However, exemptions are made for pigments, naturally occurring inorganic minerals, nanocellulose, synthetic amorphous colloidal silica and polymer dispersions. Exemption for synthetic amorphous colloidal silica is includes unmodified and modified with

[49] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0070&from=EN (Accessed 2020-08-21)
[50] REGULATION (EC) No. 1907/2006 of the EUROPEAN PARLIAMENT AND THE COUNCIL of 18 December 2006 concerning the registration, authorisation and restriction of chemicals (Reach) http://eur-lex.europa.eu/legal-content/sv/TXT/PDF/?uri=CELEX:02006R1907-20160203

aluminium/alumina and/or boron or dimethyl siloxane polymer. Other modifications can be approved after assessment by Nordic Ecolabelling.

Nano-titanium dioxide is not considered to be a pigment, but a nanomaterial that is added to give the products new properties and is therefore not exempted from the requirement.

Microplastics

Microplastics can have adverse effects on health and the environment due to their size, resistance to degradation and surface properties, either by physically affecting organisms or because they carry harmful chemicals. Microplastics can accumulate in living organisms, for example shellfish and fish, and be ingested by humans through food or water[51]. There is however a lack of knowledge of fate and effects of microplastics. Since they are non-degradable and potentially harmful precautionary principle is used and microplastics are excluded.

Endocrine disruptors

Endocrine disruptors (EDs) are chemicals that alters the functioning of the endocrine (hormone) system and consequently causes adverse health effects. The hormone system regulates many vital processes in living organisms and when normal signalling is disturbed, adverse effects may arise. Special concern is raised in connection to effects on reproduction and development and about possible links to increases in public health diseases. While effects in wildlife populations have been confirmed, evidence is pointing to effects also in humans.

Currently, endocrine disrupting properties is not a hazard that is classified according to the CLP regulation. Also, harmonised scientific criteria for identification of EDs is missing across different pieces of EU legislation. Few EDs have been identified in the legislation so far, compared to the numbers of potential EDs. Under these circumstances, Nordic Ecolabelling excludes identified and potential EDs listed by the EU member state initiative "Endocrine Disruptor Lists" at www.edlists.org. A substance listed on any of List I and/or III is excluded. The companies are responsible for keeping track of updates on the lists, in order for their assessed products to comply with the Nordic Swan Ecolabel requirement. Nordic Ecolabelling acknowledges the challenges associated with new substances being introduced on List III. Nordic Ecolabelling will evaluate the circumstances and possibly decide on a transition period on a case-by-case basis.

Nordic Ecolabelling excludes potential EDs on the EU Commission list of substances prioritized for ED evaluation, category 1 and 2 (updated ranked priority list in DHI study 2007 https://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf). A potential ED on the 2007 list is exempted if it has since been evaluated and found not to be an ED under EU legislation. By these means, Nordic Ecolabelling ensures a restrictive policy on Eds.

[51] 3 Annex XV restriction proposal for Intentionally added microplastics, Version number: 1, 11 January 2019, https://echa.europa.eu/documents/10162/82cc5875-93ae-d7a9-5747-44c698dc19b6

Note that substances included in the candidate list for endocrine disruptive properties are excluded through a previous bullet point in the list in requirement O2.

Titanium dioxide

On February 18, 2020, the European Commission published the decision that titanium dioxide will be classified as a suspected carcinogen (Category 2) upon inhalation under the CLP Regulation. The classification is only applicable to mixtures in the form of powders containing at least 1% of titanium dioxide particles which are in the form of or incorporated into particles having an aerodynamic diameter of ≤ 10 µm. This means that if titanium dioxide or mixtures thereof are not in this specific form, the classification does not apply.

Liquid and certain solid mixtures are not classified, which is why Nordic Ecolabelling has made an exception for the use of titanium dioxide in non-dusting form, i.e. wet products.

7.5 Requirements applicable to specific chemical products

Requirements applicable to specific chemicals are set with respect to the following chemical products. Forms that are equivalent to declarations in this document (in parentheses) are available in web-based application tool:

- Cleaning agents and dispersants (Appendix 4)
- Deinking chemicals (Appendix 5)
- Biocidal products and slimicides (Appendix 6)
- Coating chemicals, retention agents and flocculants (Appendix 7)
- Wet strength agents (Appendix 8)
- Foam inhibitors/defoamers (Appendix 9)
- Paper colourants (Appendix 10)
- Adhesives (Appendix 11)
- Starch products, GMO (Appendix 12)
- Declaration from the pulp and paper manufacturer (Appendix 13)

O3 Cleaning agents and dispersants

Alkylphenol ethoxylates or other alkylphenol derivatives must not be added to cleaning agents or dispersants.

The chemical manufacturer/supplier must demonstrate compliance with the requirement by duly completing and signing Appendix 4 in the web-based application tool.

Background to requirement

The requirement has not been changed. Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD) are a group of non-readily degradable surfactants that are proven endocrine disruptors. The primary use of alkylphenols is as raw material for the production of alkylphenol ethoxylates. The latter substances are surfactants and are used in detergents, dispersers and emulsifiers. Uses for

nonylphenol ethoxylates are found as a catalyst in the plastic, paper and pulp industries, in textiles, in paint, cleaning agents, adhesives and lubricants. Alkylphenol ethoxylates may be present in cleaning agents, felt-washing agents, de-inking chemicals, foam inhibitors, dispersants and coatings. In accordance with the precautionary principle, a prohibition is imposed on the addition of all alkylphenol ethoxylates, and alkylphenol derivatives, to chemical products used in pulp and paper production.

O4 Deinking chemicals

All surfactants used in deinking processes must be readily or inherently biodegradable.

Surfactants based on silicone derivatives are exempted from this requirement if sludge from the deinking process is incinerated.

Alkylphenol ethoxylates or other alkylphenol derivatives must not be added to deinking chemicals.

The chemical manufacturer/supplier must report ingoing surfactants, stating complete names and CAS no. in accordance with Appendix 5 in the web-based application tool. The result of testing for biodegradation must be reported e.g. in a safety data sheet.

If the exemption to silicone derivatives is applied, the **pulp/paper producer** must certify how the requirements for the exemption are met by duly completing and signing Appendix 13 in the web-based application tool.

Background to requirement

The requirement has been adjusted. Requirement concerning the amount of surfactants used that the paper manufacturer must report has been removed in order to clarify the requirement. This is also a harmonisation with EU Ecolabel's newly revised criteria for graphic paper and tissue paper and tissue products[52]. See O2 for requirements regarding alkylphenol ethoxylates or other alkylphenol derivatives.

Surfactants are used in production of pulp and paper. Development of the industry has led to the use of more effective substances that can be added in much smaller quantities than is the case for traditional deinking chemicals. Environmental concerns are raised by the toxicity of these substances in combination with poor biodegradability and risk for bioaccumulation. Testing the bioaccumulation potential of surfactants is, however, difficult, as standard testing methods do not work due to the chemical structure and function of these substances. It is for these reasons that requirements continue to be set with respect to the biodegradability of surfactants.

Surfactants based on silicone derivatives are exempted from this requirement if sludge from the deinking process is incinerated. Pulp/paper producer must document the fate of sludge to Nordic Ecolabelling.

See requirement O3 for requirements regarding alkylphenol ethoxylates and alkylphenol derivatives.

[52] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0070&from=EN

O5 Biocidal products and slimicides

Active organic substances in biocidal products used for countering slime-forming organisms in pulp and paper production must be approved or under evaluation according to regulation (EU) No 528/2012 and they must not be bioaccumulative.

Biocides/slimicides are deemed not to be bioaccumulative if BCF < 500 or logKow < 4. If both values are available, the value for the highest measured BCF is to be used, see Analyses and Test Methods in Appendix 2.

The chemical manufacturer/supplier must report biocides/slimicides, stating their complete name and CAS no. in accordance with Appendix 6 in the web-based application tool.

Test results on the bioaccumulation potential of the active substances must be reported e.g. in safety data sheets.

Background to requirement

The requirement has been adjusted by including reference to regulation (EU) No 528/2012. Active organic substances in biocides used for countering slime-forming organisms in pulp and paper production must be approved or under evaluation according to regulation (EU) No 528/2012. This is legal requirement in the EU but considered relevant to include in the requirement for biocides as Nordic Ecolabelling accepts applications for licences to carry the Nordic Swan Ecolabel from across the world; thus, the reach of Nordic Ecolabelling requirements extends to pulp and paper production beyond the boundaries of the EU.

Closed systems for the circulation of water used in pulp and paper mills that are intended to lower environmental impact also increases the risk of growth of microorganisms, composed of different species of bacteria or fungi. Uncontrolled growth can lead to slime formation, inorganic and organic deposits, production of gas and corrosion. These may, in turn, affect the capacity of the paper machine and lead to a decline in the quality of the paper product. Consequently, biocides occasionally must be used in the production of pulp or paper.

There are several different types of biocides on the market. Certain products kill the microorganisms and biodegrade immediately, whereas others have a long-term effect. It is, consequently, in the nature of biocides to be toxic. Moreover, rapid biodegradability may not necessarily be desirable if the product is to perform a preventive function. It is, however, considered appropriate to set requirements with respect to bioaccumulation. All biocides used in pulp and paper production are required to be non-bioaccumulative. For example, biocides added to preparations of coating slurry must be non-bioaccumulative. Biocides used in the treatment of crude water, in energy generation and in maintenance work that is not defined as maintenance of pulp and paper production equipment are exempted from the requirement. Inorganic biocides do not bioaccumulate in organic form and therefore fall outside the scope of the requirement, however they can be registered in the web-based application tool.

O6 Coating chemicals, retention agents and flocculants

The following substances must not be added to coating agents, retention agents and flocculants:

- Alkylphenol ethoxylates or other alkylphenol derivatives
- Bisphenol A, F and S

Please note that the paper producer must also verify that Bisphenol A, F and S are not used in production of the paper.

The chemical manufacturer/supplier must demonstrate compliance with the requirement by duly completing and signing Appendix 7 in the web-based application tool.

The **paper manufacturer/supplier** must verify that the requirement for bisphenol A, F and S is met by duly completing and signing Appendix 13 in the web-based application tool.

Background to requirement

Besides bisphenol A, bisphenol F and S are now prohibited from use in coating agents, retention agents, flocculants. These can be used as a substitute for bisphenol A. Therefore, Nordic Ecolabelling has introduced a prohibition of these two additional bisphenols on the basis of the precautionary principle and the suspicion that these substances may be endocrine disruptors.[53].

See requirement O3 for requirements regarding alkylphenol ethoxylates and alkylphenol derivatives.

O7 Wet strength agents

Alkylphenol ethoxylates or other alkylphenol derivatives must not be added to wet strength agents.

Wet strength agents must not contain more than 100 ppm (0.01%) in total of the low molecular organochloride compounds epichlorohydrin (ECH), dichloroisopropanol (DCP) and chloropropanediol (CPD) – calculated on the basis of the dry matter content.

The manufacturer/supplier of organochloride wet strength agents must certify that the requirement is fulfilled by duly completing and signing Appendix 8 in the web-based application tool.

Background to requirement

The requirement has not been changed. The requirement is that wet strength agents must contain a total of no more than 100 ppm (0.01%) low molecular organochloride compounds epichlorohydrin (ECH), dichloroisopropanol (DCP) and chloropropanediol (CPD) – calculated on the basis of the dry matter content.

Wet strength agents are necessary in order to increase the strength of products when they come into contact with liquids. As such, they are relevant to the function of the product[54]. Wet strength agents are often used in kitchen towels, napkins and wipes, but also in lesser quantities in copy and printing paper.

[53] Johanna R. Rochester and Ashley L. Bolden Bisphenol S and F: A Systematic Review and Comparison of the Hormonal Activity of Bisphenol A SubstitutesEnviron Health Perspect; DOI:10.1289/ehp.1408989 http://ehp.niehs.nih.gov/wp-content/uploads/advpub/2015/3/ehp.1408989.acco.pdf

[54] Reference document on Best available techniques in the Pulp and Paper industry, Integrated Pollution Prevention and Control (IPPC), December 2001

The wet strength agents used in paper are mainly polyamide-epichlorohydrin resins, which give the paper durable wet strength. The complete development of wet strength (polymerisation) in a paper product takes about a week. Subsequently, a small amount of residual monomers, such as ECH and its reaction products DCP and CPD, may be left in the paper product. DCP and CPD are usually formed during synthesis and storage of epichlorohydrin (Braga et al, 2009)[55]. Both ECH and DCP have received a harmonised classification of Carc. 1B by ECHA, meaning that they may cause cancer[56,57]. CPD is volatile and can be released from the paper to air during drying. Although it lacks a harmonised classification from ECHA, several companies have submitted dossiers in which they have classified it as both Repr. 1B and Carc. 2[58]. Both of the reaction products are skin penetrating. Epichlorohydrin resins are also toxic to aquatic organisms and do not readily biodegrade. 90% of all wet strength agents used remains in the paper, and less than 10% is released into the wastewater system.

See requirement O3 for requirements regarding alkylphenol ethoxylates and alkylphenol derivatives.

O8 Foam inhibitors and defoamers

Alkylphenol ethoxylates or other alkylphenol derivatives must not be added to foam inhibitors.

None of the ingoing substances in the foam inhibitor/defoamer that have a foam inhibiting or foam retarding effect may be classified as H400, H410, H411, H412 and H420.

As an alternative, 95 w% of the ingoing substances in the foam inhibitor/defoamer with a foam inhibiting or foam retarding effect must be either readily or inherently biodegradable.

Foam inhibitors/defoamers that are destroyed in the chemical recycling process are exempted from this requirement.

The chemical manufacturer/supplier of a foam inhibitor/defoamer must demonstrate compliance with the requirement by duly completing and signing Appendix 9 in the web-based application tool.

If foam inhibitors/defoamers consist of a mixture of substances, each ingoing substance that have a foam inhibiting or foam retarding effect must be stated with its full name, CAS no. and concentration. The result of testing for biodegradability of the individual substances must be reported for example in safety data sheets and with a completed Appendix 9 in the web-based application tool.

If the exemption to foam inhibitors/defoamers destroyed in chemicals recycling is applied, **pulp/paper producer** must certify how the requirements for the exemption are met by duly completing and signing Appendix 13 in the web-based application tool.

[55] Braga D., Kramer G., Pelzer R., Halko M., Recent developments in wet strength chemistry targeting high performance and ambitious environmental goals, Professional Papermaking 3-4/2009
[56] https://echa.europa.eu/sv/substance-information/-/substanceinfo/100.003.128
[57] https://echa.europa.eu/sv/substance-information/-/substanceinfo/100.002.266
[58] https://echa.europa.eu/sv/brief-profile/-/briefprofile/100.002.267

Background to requirement

The requirement has not been changed. Several types of defoamers are in use in pulp/paper production, of which the most common are silicone-based, mineral oil-based and those based on EO/PO block copolymers, which are non-ionic surfactants. Silicon-based defoamers are especially effective and are added in smaller quantities than those based on mineral oil. They are not toxic, and their biodegradability is difficult to test as silicon does not dissolve in water and is chemically inert. EO/PO block copolymers may not be readily biodegradable.

Mineral oil-based defoamers are not readily biodegradable but may be assumed to be potentially biodegradable and possibly prone to bioaccumulate. They may also contain small amounts of aromatic substances and dioxins, even if their toxicity with respect to aquatic organisms is low.

See requirement O3 for requirements regarding alkylphenol ethoxylates and alkylphenol derivatives.

O9 Paper colourants, metals

Dyes or pigments in paper colourants that are based on aluminium, silver, arsenic, barium, cadmium, cobalt, chromium, copper, mercury, manganese, nickel, lead, selenium, antimony, tin or zinc must not be used for dyeing, shading, colouring or printing.

Copper in phthalocyanine pigment and aluminium in aluminosilicates are exempted from this requirement.

The levels of ionic impurities in the paper colourants used must not exceed the following limits:

- Antimony: 50 ppm
- Arsenic: 50 ppm
- Barium: 100 ppm
- Cadmium: 20 ppm
- Chromium: 100 ppm
- Cobalt: 500 ppm
- Copper: 250 ppm
- Lead: 100 ppm
- Mercury: 4 ppm
- Nickel: 200 ppm
- Selenium: 20 ppm
- Silver, 100 ppm
- Tin: 250 ppm
- Zinc: 1 500 ppm.

The manufacturer/supplier must demonstrate compliance with the requirement by duly completing and signing Appendix 10 in the web-based application tool.

Background to requirement

The requirement has been partly adjusted and harmonised with EU Ecolabel's requirement for metal-based pigments and dyes, including ionic impurities, in the criteria for graphic paper and tissue paper and tissue products. However, definition of metal-based pigments and dyes given in EU Ecolabel (containing more than 50% by weight of the relevant metal compound) is not applied in the Nordic Swan Ecolabel. The Nordic Ecolabelling requirement is absolute – dyes must not be based on these metals, there is no limit value for the weight of relevant metal compound, when the requirement is applied.

This harmonisation means that the disputable term 'heavy metals' is removed from the requirement. Instead it is specified which metals the dyes cannot be based on. Furthermore, the list of ionic impurities that are restricted in the dyes has been expanded with antimony, arsenic, barium, cobalt, copper, nickel, selenium, silver, tin and zinc. The limit values for impurities previously included in the Chemical Module; lead, mercury, chromium and cadmium; remain unchanged.

The requirement with respect to ionic impurities in paper colourants is intended to reduce the presence of the listed metals to those levels of impurity that are considered to be the lowest attainable. The limits are set to make it impossible to add these metals actively to paper colourants. The threshold values are the same as those set by the EU Ecolabel in their newly revised criteria for graphic paper and tissue paper and tissue products[59].

O10 Paper colourants, amines and phthalates

Azo dyes, which by reductive cleavage of one or more azo groups may release one or more of the aromatic amines listed in Regulation (EC) No 1907/2006 Annex XVII, Appendix 8, must not be used.

Phthalates must not be present in the paper colourants used.

The producer/supplier must demonstrate compliance with the requirement by duly completing and signing Appendix 10 in the web-based application tool.

Background to requirement

The requirement has been adjusted to clarify that it regards azo dyes that by reductive cleavage of one or more azo groups may release one or more of the aromatic amines listed in Regulation (EC) No 1907/2006 Annex XVII, Appendix 8.

Azo dyes that liberate the aforementioned aromatic amines are no longer offered by dye manufacturers in Europe. Although the majority of coloured paper carrying the Nordic Swan Ecolabel is manufactured in Europe, Nordic Ecolabelling accepts applications for pulp and paper worldwide. The same legal requirements regarding azo dyes do not necessarily exist outside the EU and it is therefore important for countries outside the EU to be aware of this.

Phthalates are esters of phthalic acids (1,2-benzene dicarboxylic acid) and have been banned in paper colourants in the previous versions of the Chemical

[59] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0070&from=EN

Module. Phthalates are a group of substances that comprise many different substances. Several phthalates are reprotoxic and environmentally hazardous.

O11 Adhesives

Adhesives used in the production or conversion of the product must not contain the following ingoing substances:

- Alkylphenol ethoxylates or other alkylphenol derivatives
- Phthalates
- Halogenated volatile organic compounds
- Ethylene glycol ethers classified as any of the hazard phrases listed in Table 1 in requirement O1.

The requirement is not applicable to sizing.

The chemical manufacturer/supplier must demonstrate compliance with the requirement by duly completing and signing Appendix 11 in the web-based application tool.

Background to requirement

The requirement is changed with regard to ethylene glycol ethers and a clarification is made that the requirement is not applicable to products used for sizing.

Ethylene glycol ethers classified in accordance with Table 1 in requirement O1 are prohibited in adhesives, compared to version 2 of the Chemical Module where all ethylene glycol ethers were prohibited. See O3 and O10 respectively for requirements with respect to alkylphenol ethoxylates or other alkylphenol derivatives and phthalates.

Both halogenated solvents and ethylene glycol ethers are volatile organic compounds, VOCs. Volatile organic compounds are undesirable, since they are typically harmful to health, often non-readily degradable in an aquatic environment and can have negative effects on the earth's ozone layer. In addition to this, some halogenated solvents have been classified as carcinogenic and they may also be toxic for aquatic organisms and do not easily degrade. Therefore, the presence of halogenated solvents in adhesives used in Nordic Swan Ecolabelled paper is prohibited. Ethylene glycol ethers that are classified in accordance with Table 1 are now prohibited, which allows the use of less hazardous alternatives.

See requirement O3 for requirements regarding alkylphenol ethoxylates and alkylphenol derivatives. See requirement O10 for requirements regarding phthalates.

O12 Starch – GMO

Starch used in production must not derive from genetically modified organisms (GMO), e.g. certain potato and maize starches.

Starch refers to cationic starches used e.g. in surface sizing.

The chemical manufacturer/supplier of the starch product must demonstrate compliance with the requirement by duly completing and signing Appendix 12 in the web-based application tool.

Background to requirement

The requirement has not been changed except that a clarification of what "starch" refers to has been added. GMOs (genetically modified organisms) that can be relevant in starch products used in paper are maize and potato. About 30 percent of the world's commercially available maize is GMO[60] whereas GMO starch potato is not cultivated at the moment[61].

GMOs are highly controversial, and several countries have banned cultivation of GMOs. Topics that are discussed include food security, land use, lack of scientific knowledge about effects under local agricultural/forest conditions and risk of adverse effects on health and the environment.

Nordic Ecolabelling emphasises the precautionary principle and bases its position on regulations that maintain a holistic approach to GMOs, and that emphasise sustainability, ethics and benefit to society together with health and the environment. Nordic Ecolabelling is not against genetic engineering or GMOs as such but is concerned about the consequences when genetically modified plants, animals and microorganisms are propagated in nature. Nordic Ecolabelling believes that GMOs should be assessed on a case by case basis.

Research has not clearly shown that today's GMOs contribute towards sustainable agriculture with lower use of pesticides and there is a lack of research on long-term consequences of GMOs, both environmental, social and economic consequences. There are possible adverse effects of GMOs along the entire value chain from crop research and development, through cultivation, storage, use and waste management[62]. In several of these stages, there is a lack of scientific studies, and there is a lack of holistic assessment[63,64,65]. Today's GMOs are also adapted to industrial agriculture with companies that have gained a monopoly-like position, and the Nordic Ecolabelling wishes to limit the negative consequences of this.

7.6 Changes compared to previous generation

This section describes changes that have not been mentioned in sections above.

Chemical requirement for paper/pulp manufacturers

In the current Chemical Module, version 2, the requirement regarding production chemicals used in production of pulp/paper (O1) is amended by merging it with the requirement concerning pulp/paper manufacturer in the Basic Module (O8). Requirement O8 in the Basic Module stipulates that pulp/paper manufacturer must report all production chemicals used. All chemicals in pulp and paper

[60] ISAAA (2019) Brief 54: Global Status of Commercialized Biotech/GM Crops: 2018. http://isaaa.org/resources/publications/briefs/54/default.asp (3.10.2019)
[61] https://www.reuters.com/article/us-eu-gmo-potato/eu-court-annuls-approval-of-basfs-amflora-gmo-potato-idUSBRE9BC0DI20131213 (3.10.2019)
[62] Catacora-Vargas G (2011): "Genetically Modified Organisms – A Summary of Potential Adverse Effects Relevant to Sustainable Development. Biosafety Report 2011/02, GenØk – Centre for Biosafety.
[63] Catacora-Vargas G (2011): "Genetically Modified Organisms – A Summary of Potential Adverse Effects Relevant to Sustainable Development. Biosafety Report 2011/02, GenØk – Centre for Biosafety.
[64] Fischer et al. (2015) Fischer et al. (2015): Social impacts of GM crops in agriculture: a systematic literature review. Sustainability 7:7.
[65] Catacora-Vargas G et al. (2018): Socio-economic research on genetically modified crops: a study of the literature. Agriculture and Human Values 35:2.

production must comply with the requirements outlined in the Chemical Module version 3.

From now on, generation 3 of the Chemical Module shall mainly be used by chemical producers whereas all requirements relevant to pulp/paper manufacturers are presented in the Basic Module. However, requirements O1, O4, O6 and O8 in the Chemical Module contain sub requirements that shall be declared by pulp/paper manufacturer in their web-based application tool.

This is done to clarify which requirement is applied to pulp/paper manufacturer and which concerns chemical manufacturer/supplier.

Exemption to Classification of Production Chemicals (O2)

In the classification requirement O2 of the previous Chemical Module, version 2 there is an exemption applied to pulp/paper producers. If the consumption of the chemical is less than 0.05 kg/tonne produced pulp or producer paper, the chemical can be exempted from the requirement for classification. The limit value was introduced during the last revision of the criteria and was mainly based on some paper colourants used. As the paper colourants are covered by other exemptions given in the requirement, this exemption related to used amounts is removed in order to clarify the structure of the Chemical Module.