Nordic Ecolabelling for

Tissue Paper and Tissue Products – Supplementary Module

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Background document

Nordic Ecolabelling

Content

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Contact information

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

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1 Summary

The Nordic Swan Ecolabel criteria for Tissue paper have been revised to generation 6. The focus of this revision has mainly been on reduced energy consumption including reduced emissions of greenhouse gases. Requirements concerning energy and greenhouse gases are, thus, considerably stricter than in the previous generation. There is also a new requirement for ban on fossil oil and coal used as fuels in the production of process heat in the tissue paper mill.

The criteria have also been updated from a circular economy point of view, new requirements for packaging have been introduced, which promote recycled materials and recyclability of the packaging. In addition to that, at least 70% of the fibres used in the tissue paper, including cores, must come from sustainably managed forests or be recycled.

The requirements for chemicals have also been updated. The limit values for chloro-organic substances in wet strengths agents have been tightened from 7000 ppm to 3500 ppm and for auxiliary chemicals from 500 to 300 ppm. Regarding tissue products marketed in contact with food, Nordic Swan Ecolabelled kitchen towels and napkins must comply with BfR's recommendation XXXVI. Paper and board for food contact, April 2021 or more recent versions. There are also new substances included in the requirement concerning content of harmful substances in paper marketed in contact with food. Recycled fibre or mixes of recycled and virgin fibre must now be tested for migration of Bisphenol A, F and S and content of Total Organic Fluorine (TOF).

Nordic Swan Ecolabel Criteria are based on a life cycle perspective, so that the requirements are set in the phases in the paper's life cycle that have the greatest relevance and potential from an environmental point of view. Nordic Swan Ecolabelled tissue paper and tissue products:

- Is manufactured in a climate- and energy efficient way, with reduced energy consumption and reduced emissions of greenhouse gases. This means that fossil oil and coal are excluded in production.
- Is made of traceable fibres from conrolled sources. At least 70 % of the fibres must come from certified products or be recycled.
- Generates less emissions to air and water during production.
- Meets strict requirements concerning chemicals that are hazardous to health and harmful to the environment.

The requirements for paper products are gathered in a so-called modular system, where the Basic Module and the Chemical Module include the general requirements for pulp and paper production, including requirements for fibres. The Basic and Chemical Modules to generation 3 were revised in 2020. the changes made in the last revision of these Modules also affect Tissue Paper Criteria.

2 Environmental impact of the tissue paper

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, namely:

- forestry
- chemicals
- energy consumption
- emissions to air and water

during production of pulp and paper. By setting requirements for sustainability, sourcing of fibres or recycled fibres, production chemicals, energy consumption, emissions to air and water and waste Nordic Ecolabelling is able to set requirements that are relevant for the environment. These environmental impacts are described exhaustively in the background document for paper products – the Basic Module, generation 3.

2.1 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 a lesser impact on the environment, and the requirements ensure control of the value chain.

- 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 tissue paper products also contribute to other UN Sustainable Development Goals:

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

Requires efficient use of resources

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

Promotes biodiversity and sustainable use of terrestrial ecosystems

Fibre raw materials must be sustainably sourced

Strict requirements on chemicals

3 Justification of the requirements

This chapter presents proposals for new and revised requirements, and explains the background to the requirements, the chosen requirement levels and any changes compared with the previous generation 5 of the Supplementary Module for Tissue Paper. Many of the arguments for the proposed changes are also explained in more detail in the background document for paper products – Basic Module and Chemical Module, generation 3.

3.1 Definition of the product group

Cellulose-based tissue paper and tissue products made from virgin and/or recycled fibres may be licensed to carry the Nordic Swan Ecolabel. This means that, for example, toilet paper, kitchen and household towels, napkins, hand towels, facial tissue and handkerchiefs can be Nordic Swan Ecolabelled.

The product group shall not include:

- Fragranced tissue products
- Tissue products containing cleaning agents designed for the cleaning of surfaces (e.g. floor cleaning agents)
- Structured paper
- Products that contain viscose or fossil-based binders or that are laminated with non-cellulose based material or cellulose fibre-based material such as e.g. bio-based plastics. Several of these products are covered by the criteria for Nordic Ecolabelling of Sanitary Products.
- Cosmetic products within the Regulation (EC) No 1223/2009 of the European Parliament and of the Council (8), including wet wipes; wet wipes may be labelled in accordance with the Criteria for Cosmetic Products, which specify that the paper material must fulfil the Nordic Swan Ecolabel or EU Ecolabel requirements on tissue paper.

Background to product definition:

The definition of product group is unchanged. However, it has been clarified that both tissue paper, that is base paper taken from the tissue machine before conversion, and the finished tissue product can be Nordic Swan Ecolabelled. Definitions are now in line with ISO 12625-1, and subsequently, the name of the Supplementary Module is renamed to Tissue Paper and Tissue Products.

It is also clarified in the text that structured paper is not included in the product group. For more information about structured paper, see also Chapter 5 Areas that are not subject to requirements.

Contact Nordic Ecolabelling for further information on the ecolabelling of such products.

3.2 Definitions

Term	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%
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 3.13. of Directive 2010/75/EU).
BCTMP	Bleached CTMP, see also CTMP.
Broke	Broke is waste from production (scrap, strips from cutting the rolls at the paper mill etc.) and is not classified as recycled fibre, see also recycled fibre.
MCPD	Monochloropropanediol (MCPD), see also ECH

COD	Chemical oxygen demand (COD) indicating the amount of chemically oxidisable organic matter in wastewater.
CTMP	Chemithermomechanical Pulp, see also BCTMP.
Coating	Yankee coating refers to auxiliary chemicals used to improve manufacturing conditions such as adhesion and release of paper web on the Yankee cylinder.
Coating in converting	Process to apply additives (chemicals, lotion) onto the tissue sheet during converting
Converting	Manufacturing of a tissue product by a process or operation applied after the papermaking process.
DCP	Dichloroisopropanol (DCP), see also ECH.
De-inked pulp	De-inked pulp (DIP) means pulp made from paper for recycling from which inks and other contaminants have been removed;
ECH	The wet strength agents used in paper are mainly polyamide-epichlorohydrin resins, which give the paper durable wet strength. A small amount of residual monomers, such as epichlorohydrin (ECH), and its reaction products Dichloroisopropanol (DCP) and Monochloropropanediol (MCPD), may be left in the paper product.
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.
Laminating	Process of joining together two or more plies of a tissue material (tissue paper web, tissue paper sheet) to form a multi-ply tissue product.
Plant based fibres	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 wastewater treatment chemicals are included, see closely the Chemical Module.
Recycled fibre	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.
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.
Structured paper	Base paper produced on a tissue machine using a structured fabric or belt.
TAD	Through-air drying (TAD) is process in which the wet-formed tissue web is partially or totally dried and structured by blowing hot air through the running web on one or more cylinders while the web is supported by an imprinting fabric or belt.
Tip fuel	Tip fuel is peak load fuel that is only used for short periods, e.g. when it is really cold.
Tissue paper	Base paper taken from the tissue machine before conversion (typically between 10 g/m^2 and 50 g/m^2), defined in accordance with ISO 12625-1.
Tissue product	Tissue paper that has been converted into a finished product for end-user purposes. defined in accordance with ISO 12625-1.
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.

3.3 Information about production

O1 Description of the product

Applicant shall provide the following information about the tissue paper and tissue product(s):

- Name of the tissue paper and tissue product manufacturer.
- Trademark/trade name of the tissue paper and tissue product, type (as e.g. toilet paper, kitchen towel, napkins) and grammage (g/m^2) for which tissue paper(s) is/are available.
- Describe the manufacturing process for the product, including conversion and waste water treatment. State also annual production volumes.
- Compile a list of constituent materials, e.g. production chemicals, pulps and packaging materials used. In the case of production chemicals, report all production chemicals used in the production of paper and in conversion, providing documentation regarding the product's complete name, function, area of use in the mill, supplier and quantities used in kg/tonnes paper. For pulps, the production site must be stated.

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

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

Representative product samples are to be supplied upon request from Nordic Ecolabelling.

Background to the requirement

The requirement is unchanged. However, it is amended slightly in order to clarify which basic information is required regarding the tissue paper and tissue product.

O2 Pulp

All pulps used in the manufacture of Nordic Swan Ecolabelled tissue paper and tissue products must meet the requirements stipulated in the Basic Module and the Chemical Module, generation 3 or later unless otherwise indicated in the requirements below. This also applies to on-site manufactured recycled and de-inked pulp.

If the pulp has already been assessed by Nordic Ecolabelling, the requirement is fulfilled. State information on the trade name, production site and the manufacturer of the assessed pulp.

Pulp assessed by Nordic Ecolabelling, enclose information on the trade name, production site and the manufacturer of the pulp.

Pulp not assessed by Nordic Ecolabelling, **the pulp manufacturer** shall submit documentation required from the pulp mill with the aid of the web-based application tool.

O3 Tissue paper and tissue products

Manufacturing of the tissue paper and finished tissue product must meet the requirements of the Basic Module and the Chemical Module, generation 3 or later, where relevant, unless otherwise indicated in the requirements below. This also applies to converters (e.g. requirement for waste).

The core in the finished tissue product such as in toilet paper and kitchen rolls shall meet certification requirement O7 d) for Fibre raw material in the Basic Module, generation 3. The core must not be marketed as flushable.

The tissue paper and product manufacturer shall submit documentation demonstrating compliance with relevant requirements in the Basic and Chemical Modules, generation 3 with the aid of the web-based application tool.

Tissue product manufacturer shall submit documentation demonstrating that the requirement for core is fullfilled.

Background to the requirement

Requirements O2 and O3 are changed. Instead of following the Basic Module and Chemical Module, generation 2, tissue paper and tissue product must meet the requirements set in the Basic Module and Chemical Module, generation 3 (O3). This applies also to pulps used in production of tissue paper (O2). There is also a new requirement that the core in the finished tissue product shall meet the certification requirement O7 d) for fibre raw material in the Basic Module, generation 3, see also closely requirement (O16) for paper packaging later in this Tissue Paper Criteria. There is also a new requirement that the core must not be marketed as flushable. Waste water treatment plants in the Nordic countries do not recommend to flush down cores in the toilet. The main argument for this is that cores always belong in the waste flow to recycling and not in the toilet. Flushable cores will contribute to households not keeping track of which toilet rolls are not flushable, with a risk of causing drain stops.

The Basic and Chemical Modules were revised from generation 2 to generation 3 in 2020[1]. The major changes in the Basic Module are the following:

- Regarding the requirement for fibre raw material (O7), the limit of certification has been increased from 30% to 70% in paper. For paper manufactured from recycled fibres, the limit is at minimum of 70% or alternatively, a combination of certified and recycled fibres attaining 70%. Recycled material is defined according to ISO 14021, see also definitions of broke, recycled fibre and residual in this Background for Tissue Paper and Tissue Products.

- There is also an updated requirement for restricted tree species not to be used in Nordic Swan Ecolabelled paper products (O7). Eucalyptus and Acacia used for pulp and paper production are exempted from the list. However, fibre raw material originating from Acacia and Eucalyptus plantations must be a minimum of 70% certified. It is the tissue paper manufacturer who shall document, for instance based on invoice or delivery note, that the requirement of minimum 70% certified pulp are purchased on a yearly basis.

- For pulps such as chemical pulp and CTMP (chemithermomechanical pulp) including BCTMP (bleached CTMP), reference values regarding energy (Appendix 4) and emissions to water/air (Appendix 5), have been

[1] https://www.nordic-ecolabel.org/product-groups/group/?productGroupCode=044, see documents under Application.

tightened. Regarding chemical pulps manufactured from Eucalyptus, there is a specific reference value for phosphorus (P) allowing higher emissions (0.08 kg/ADt compared to 0.025 kg/ADt). Regarding energy, calculation method for the energy score has been changed, see also closely O4 in this Background document.

- The requirement for emissions of greenhouse gases (O10) has been changed. The greenhouse gas requirement only encompasses fuels used for production of process heat and not electricity as in the previous generation.

Major changes in the Chemical Module:

- The requirement for classification of chemical products (O1) has been expanded with hazard class and hazard statement Aquatic Chronic 3 - H412.

- There is a new requirement for prohibited substances (O2), such as substances on the Candidate list shall not be ingoing substances in chemical products used in the production of pulp and paper. Subsequently, some former requirements are removed, such as the requirement concerning residual monomers, as these are now covered by the new requirement.

- The definition of ingoing substances and impurities in chemical products has been updated, the limit for impurities in the chemical product is 1000 ppm.

For a product to be granted a licence to carry the Nordic Swan Ecolabel, the relevant requirements in the Basic Module and Chemical Module, generation 3 or later, in addition to the requirements in this Supplementary Module, must be fulfilled. Documentation demonstrating compliance with relevant requirements for the Nordic Swan Ecolabelled tissue paper and tissue products are to be submitted with the aid of the web-based application tool.

Nordic Ecolabelling has longstanding experience with requirements of pulp and paper products. 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 with regard to pulp and paper production.

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

Supplementary Modules, e.g. this document, 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 levels in the modules differ, the requirement levels specified in the applicable supplementary module are to be applied.

3.4 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 the greenhouse gas emission requirement. The requirements are based on information of actual energy use 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 and emissions of CO_{2e} calculation encompasses the entire production process – both tissue paper manufacturing and the constituent pulp. Energy calculations do not include energy consumed during transport of raw materials or in tissue conversion and packaging. The paper manufacturer shall verify fulfilment of the requirements. Pulp manufacturers shall, however, provide details of energy use and greenhouse gas emissions to paper producer. See also Appendix 4 in the Basic Module, generation 3 where instructions for calculations are given.

O4 Energy

The total electricity and fuel points scores for Nordic Swan Ecolabelled tissue paper and tissue product must be less than 2.3.

$P_{electricity\_total} < 2.3$

$P_{fuel\_total} < 2.3$

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

Alternatively,

$P_{paper\ electricity} + P_{paper\ fuel} < 2.3$

$P_{pulp\ electricity} + P_{pulp\ fuel} < 2.3$

A more detailed description of documentation requirements and calculation methods is provided in Appendix 4 of the Basic Module, generation 3 or later, in which $P_{electricity}$ and P_{fuel} are also defined.

The reference values for the manufacturing of tissue paper are set for consumption of fuel at 1750 kWh/ADt, and for electricity at 900 kWh/ADt.

For pulp derived from recycled fibre/de-inked pulp (DIP), use the reference values in Table 1.

Table 1 Energy for recycled fibre/de-inked pulp (DIP) manufacturing.

Process	Fuel kWh/ADt Reference value	Electricity kWh/ADt Reference value
Recycled fibre/DIP	300*	350*
Dried recycled fibre/DIP	1300	500

*In cases, where extensive washing loops including bleaching are applied, higher reference values can be used: 600 kWh/ADt for fuel and 600 kWh/ADt for electricity.

If steam from electric boilers is used, the energy content of steam must be converted to fuel. The energy of the steam is converted into fuel by multiplying the the energy content of electricity by 1.25. The resulting amount of energy is added to the fuel consumption of the production. See closely Appendix 4 in the Basic

Module, generation 3. In case of electrical hoods, electricity consumption is multiplied by 1.25 and the resulting amount of energy is added to the fuel consumption of the production.

⇪ **The tissue paper manufacturer** shall submit calculations in accordance with Appendix 4 of the Basic Module, generation 3 showing compliance with the limit values. 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.

⇪ If higher reference values for DIP are applied, **the tissue paper manufacturer** shall report why the use of these values is necessary and what sub-processes including bleaching are used in the process.

Background to the requirement

In this proposal for generation 6 of Nordic Ecolabelling Criteria for Tissue Paper and Tissue Products, the requirement for energy has been considerably tightened. Compared to the previous generation, the following key changes have been made:

- Reference values for consumption of fuel and electricity in the manufacturing of tissue paper have been changed. Regarding fuel, from 1800 kWh/ADt to 1750 kWh/ADt and for electricity from 1030 kWh/ADt to 900 kWh/ADt.
- Reference values for recycled fibre/de-inked pulp (DIP) in tissue manufacturing has also been changed. For fuel, from 500 kWh/ADt to 300 kWh/ADt and for electricity 500 kWh/ADt to 3500 kWh/ADt. In cases, where the DIP process is more comprehensive, including bleaching, higher reference values can be used, namely 600 kWh/ADt for fuel and 600 kWh/ADt for electricity. If higher reference values are applied, these sub-processes including bleaching have to be documented to Nordic Ecolabelling. Quality of the recycled materials (newspapers and office waste) is declining. This leads to higher energy demand to obtain product safety aspects in DIP production. In principle, energy consumption in recovered fibre processing depends to a large extent on the design, type and amount of process steps involved to achieve a certain product quality.

The following changes made in the last revision of the Basic Module to generation 3 also affect manufacturing of tissue paper:

- Reference values for the pulps in the Basic Module, generation 3 have been tightened.
- The total point score calculation has been adjusted in order to balance the calculation between the pulp mill and the paper mill. Point scores of the pulp mill dominated the calculation of the final scores and in order to make the comparison equal, the equation has been changed, see also closely section 4.2.3. in Appendix 4 in the Basic Module, generation 3. Consequently, the P_{total} score limit values have been adjusted from 1.15 to 2.3 in the supplementary modules in order to maintain the same degree of flexibility as in the previous generations. A new point limit of 2.3 indicates that the average value of the paper product's total energy consumption may not exceed 15% of the limit under optimal conditions. The points

model permits a higher level of energy consumption in order to allow the paper manufacturer an increased degree of flexibility.

The requirement for energy stipulates the declaration of the total energy consumption in pulp and tissue paper production processes per tonne of product, specified for fuel and electricity. This is calculated using actual values from the producer and reference values provided by Nordic Ecolabelling. These reference values specific to tissue paper have been considerably tightened in this revision. As a result, only the best mills using the best pulps can be Nordic Swan Ecolabelled. The new ambition levels are based, first and foremost, on data provided by licence holders. Following BREF findings, the indicative energy consumption levels for the non-integrated tissue paper grade is 1800-2100 kWh/ADt for fuel, and 900-1000 kWh/ADt for electricity[2]. Comparison with reference values set in the previous generations 4 and 5 and in the EU Ecolabel can be found from Table 4 at the end of this Background document.

On March 20, 2024, Nordic Ecolabelling decided to adjust the requirement, by allowing an alternative method for verifying energy consumption. Instead of calculating total scores for paper and pulp, these can be considered separately: the electricity and fuel consumption for paper are considered together, as are those for pulp. This change allows some flexibility in the choice of energy source in the manufacturing of paper. For example, higher electricity consumption is permitted, but only if fuel consumption is reduced at the same time. Similarly, energy consumption in pulp manufacturing is limited in order to keep the level of total energy use ambitious in the criteria. This change in the requirement gives flexibility in the choice of energy source, potentially facilitating future electrification efforts. Furthermore, the updated criteria enable ecolabelling of airlaid products, but only if total energy consumption is on the same level as in traditional tissue paper manufacturing. This revised version is called 6.1.

The Supplementary module of Tissue Paper and Tissue Products follows the requirements set in the Basic Module, generation 3. Therefore, the changes made in the last revision of the Basic Module also affect Tissue Paper Criteria. The background document to the Basic Module, generation 3 provides comprehensive information on the energy requirement and Appendix 4 in the Basic Module describes the calculations in detail. Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

O5 Fossil fuels

Fossil oil and coal must not be used as fuels* for production of process heat in the tissue paper mill.

Necessary use of fossil oil e.g. in planned maintenance stops, emergency maintenance stops, as a reserve and tip fuel (peak load fuel) or at start-ups for regulation of the combustion temperature in a heat and co-generation boiler is allowed.

**Use of natural gas and liquefied petroleum gas (LPG) is allowed.*

The tissue paper manufacturer shall confirm that fossil oil and/or coal are not used as fuels to produce process heat in the tissue paper mill.

[2] tissue_paper_tr_2019.pdf (europa.eu)

In case fossil oil is used as reserve or tip fuel, **tissue paper manufacturer** shall report why the use of fossil oil is necessary.

O6 Emissions of greenhouse gases

Emissions of greenhouse gases from fuels and electricity used for production of process heat must not exceed 525 kg CO_{2e} /ADt paper. CO_{2e} calculations include emissions from production of both tissue paper and constituent pulps.

If process heat is generated by electricity, CO_{2e} emissions related to electricity are calculated by factor 231 g CO_2/kWh. However, if the greenhouse gas emission intensity of electricity generation given by European Environment Agency* indicates a higher emission calculation factor for the country where the tissue mill is located, this shall be used.

* *https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-10#tab-googlechartid_googlechartid_googlechartid_googlechartid_chart_11111*

If steam from electric boilers is used, the energy content of steam must be converted to fuel. The energy of the steam is converted to fuel by multiplying the energy content of electricity by 1.25. See closely Appendix 4 in the Basic Module, generation 3.

The tissue paper manufacturer shall submit calculations in accordance with Appendix 4 of the Basic Module, generation 3 to demonstrate fulfilment of the requirement. Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

Background to the requirements

The requirement regarding fossil fuels and greenhouse gases has been changed. Compared with previous ecolabelling criteria, the following key changes have been introduced:

- There is a new requirement for ban on fossil oil and coal used for production of process heat in the tissue paper mill (O5).
- The limit value for emission of greenhouse gases is set to 525 kWh/ADt (O6). The requirement now encompasses only fuels and eletricity used for production of process heat in the tissue mill. In the earlier generation of the Criteria, all electricity used during manufacturing of tissue paper was included in the calculation. If process heat is generated by electricity, CO_{2e} emissions related to electricity are calculated by factor 231 g CO_2/kWh unless the greenhouse gas emission intensity of electricity generation given by European Environment Agency indicates a higher emission calculation factor for the country where the tissue mill is located. As in the earlier generation, the CO_{2e} calculation encompasses the emissions from production of both tissue paper and constituent pulps.

Climate change is one of the biggest environmental problems today. It is attributed directly or indirectly to human activity that alters the composition of the global atmosphere. Many tissue manufacturers are committed to reduce greenhouse gas emissions in their production[3,4,5,6]. By setting strict energy and

[3] https://www.essity.com/sustainability/why-we-do-it/science-based-targets/
[4] https://www.wepa.eu/en/responsibility/sustainability/operational-efficiency/
[5] https://www.sofidel.com/sostenibilita/agenda-onu-2030/
[6] https://www.metsatissue.com/en/Sustainability/Pages/MetsaTissue-2030-sustainability-objectives.aspx

CO_{2e} emission requirements, Nordic Ecolabelling wishes to promote a transition towards fossil-free manufacturing. General principles for setting Nordic Swan Ecolabel requirements for energy use and greenhouse gas emissions from energy are:

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

Since the production of tissue paper consumes large amounts of energy, strict requirements are set on energy consumption of electricity and fuels (O4). The purpose of the requirements for fossil fuels (O5) and on greenhouse gas emissions (O6) is to further limit the use of fossil fuels and restrict the use of fuels with the highest greenhouse gas emissions.

The requirement for fossil fuels (O5) is new in the Criteria for Tissue Paper and Tissue Products. Nordic Ecolabelling wishes to encourage fossil-free manufacturing, and therefore a ban on the use of fossil oil and coal as main fuels for production of process heat in tissue paper mill is introduced. However, necessary use of fossil oil e.g. in planned maintenance stops, emergency maintenance stops and as a reserve or tip fuel (peak load fuel) is allowed. Use of coal is, however, completely prohibited. Tip fuel is peak load fuel that is only used for short periods, e.g. when it is really cold. What is meant with reserve fuel can sometimes be a bit unclear. Reserve fuel can e.g. be defined in tissue paper mills' environmental permits issued by the authorities. Therefore, it has not been defined in more detail in the criteria itself, but the use of reserve fuel should be calculated in days.

At this point, it is not possible to exclude all fossil fuels in tissue paper manufacturing and therefore, use of natural gas and liquefied petroleum gas (LPG) is still allowed.

In this generation 6 of the Criteria, the greenhouse gas emissions of fuels and electricity used for production of process heat are limited. In the earlier generation of the Criteria, all electricity used in manufacturing of tissue paper was included in the requirement. The new calculation follows the requirement set in the Basic Module, generation 3 but the limit values are specific to tissue paper manufacturing. In addition, the requirement also encompasses electricity used for production of process heat. If process heat is generated by electricity, CO_{2e} emissions related to electricity are calculated by factor 231 g CO_2/kWh. However, if the greenhouse gas emission intensity of electricity generation given by European Environment Agency indicates a higher emission calculation factor for the country in which the tissue mill is located, this shall be used. The factor of 231 g CO_2/kWh is based on Greenhouse gas emission intensity of electricity generation in Europe[7]. Overall, the limit value for emissions of greenhouse gases is tight at 525 kWh/ADt in order to restrict the use of fuels with the highest greenhouse gas emissions and to promote use of energy sources with a lower climate impact. The new ambition level is based on license data, achievable only by the best mills using the best pulps.

[7] https://www.eea.europa.eu/ims/greenhouse-gas-emission-intensity-of-1

The background of the Basic Module provides comprehensive information on the requirement and Appendix 4 in the Basic Module describes the calculations in detail. As in the earlier generation, the CO_{2e} calculation encompasses the emissions from production of both tissue paper and constituent pulps.

Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

3.5 Emissions to water and air

The requirements on emissions to water and air are structured in such a way that the tissue paper manufacturer calculates total emissions from pulp and tissue paper production. To do this, the tissue 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 for pulps can be found in Appendix 5 Table 5.1 in the Basic Module, generation 3 or later. 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 (NOX) are finally summed to a total score. Requirements regarding the emission of AOX can be found in the Basic Module, generation 3 or later (O14).

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

O7 Total emissions score

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

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

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

$P_{emissions\ total} = P_{COD} + P_P + P_S + P_{Nox}$ must not exceed 4.0.

The calculation of the product's total emissions for recycled fibre/de-inked pulps and tissue paper production ($P_{emission\ total}$) uses the product-specific reference values given in Table 2.

To calculate the individual emission scores for P_{COD}, P_P, P_S, and P_{Nox} and for reference values for difference pulp types, please refer to the Basic Module, generation 3 or later (Appendix 5, Table 5.1).

Table 2 Reference values for emissions of tissue paper and recycled fibre/de-inked pulp (DIP) manufacturing.

Type of paper/pulp	Reference values for emissions (kg/ADt)			
	COD_{ref}	P_{ref}	S_{ref}	NOx_{ref}
Tissue paper	1.2	0.007	0.15	0.5
Recycled pulp/DIP	2.5	0.007	0.2	0.25
Sum of tissue paper & recycled pulp/DIP	3.7	0.014	0.35	0.75

Emissions from the tissue paper mill shall be reported after the wastewater treatment. Water samples must be taken after treatment of the wastewater in a treatment plant and the water flow at the time of sampling must be stated. If the wastewater is treated together with other wastewater, or if campaigns are run, samples must be taken before the treatment plant and before being mixed with other water. The results of the analysis are then reduced by the efficiency of the treatment plant, which must be documented. See also Appendix 5 in the Basic Module, generation 3.

⇪ **The tissue paper manufacturer** shall submit calculations in accordance with Appendix 5 of the Basic Module, generation 3 to demonstrate fulfilment of the requirement. Nordic Ecolabelling also provides a spreadsheet that is to be used for these calculations.

⇪ **The tissue paper manufacturer** shall submit the specific emissions (kg/ADt) of COD, P, S and NOx during the production of tissue paper. For each emission parameter, test results, method of analysis, test frequency, sampling points for emissions and the compliance of laboratories with laboratory requirements shall be enclosed (see also Section 5.3, Analyses in the Basic Module, generation 3).

Background to the requirement

The requirement regarding emissions to water and air is changed.

- The following reference values for tissue paper manufacturing have been tightened, regarding specific parameters, from 1.5 to 1.2 kg/ADt for chemical oxygen demand (COD), from 0.01 to 0.007 for phosphorus and from 0.2 to 0.15 kg/ADt for sulphur.
- Recycled pulp/de-inked pulp (DIP) used in tissue paper manufacturing now have their own specific reference values (Table 2).

The following changes made in the last revision of the Basic Module to generation 3 also affect manufacturing of tissue paper:

- Limit value for individual point score has been tightened from 1.5 to 1.3.
- Reference values for the pulps have been updated.

The reference values for COD, P and S have been made more stringent in this criteria generation. The reference values are based upon BAT report[8], published data available[9] and supplemented by a review of currently held Nordic Ecolabelling licences. There are also new reference values for recycled pulp/de-inked pulp (DIP) used in tissue paper manufacturing (Table 2). In the previous generation, reference values set in the Basic Module were applied to tissue paper. Comparison with reference values set in the previous generations 4 and 5 and in the EU Ecolabel Criteria for tissue paper and tissue products can be found from Table 4 at the end of this Background document.

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

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

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. The limit value for individual point score has been changed from 1.5 to 1.3 in the Basic Module, generation 3. This point score corresponds to the same level as introduced in the EU Ecolabel Criteria for graphic paper and the EU Ecolabel for tissue paper and tissue products[10]. The grand total score corresponds to all emission points when added together and shall not exceed 4.

Regarding adjustment in requirement O7, text concerning measurements of wastewater emissions is clarified. Wastewater can be treated on site or by an external part such as municipal wastewater treatment plant. More information on measuring and analyses can be found in Appendix 5 in the Basic Module, generation 3.

3.6 Product safety and quality

3.6.1 Chemicals

All production chemicals involved in the production of tissue paper and tissue products must comply with the requirements set out in the Chemical Module, generation 3 or later, and the requirements specified in the Supplementary Module for Tissue Paper and Tissue Products.

Requirements in respect of production chemicals not presented below, e.g. dyes and adhesives, are set out in the Chemical Module, generation 3. See Table 3 below for an overview of the chemical requirements stipulated in the Chemical Module and the Supplementary Module for Tissue Paper and Tissue Products.

Table 3 Overview of chemical requirements, indicating in which module the requirement is stipulated.

Chemicals	Chemical Module, generation 3	Supplementary Module for Tissue Paper and Tissue products, generation 6
All production chemicals - Classification (O1) - Prohibited substances (O2)	O1, O2	
Cleaning agents and dispersants	O3	
Deinking chemicals	O4	
Biocidal products and slimicides	O5	
Retention agents and flocculants	O6	
Softeners		O8
Wet strength agents[1]	O7	O9
Foam inhibitors and defoamers	O8	
Paper colourants - Metals (O9) - Amines and phthalates (O10)	O9, O10	
Adhesives	O11	
Starch - GMO	O12	

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

Yankee chemicals[2]		O9
Additives (perfumes, lotions, conditioners, cleaning agents)		O10
Paper in contact with food		O11
Content and harmful substances and bleeding		O12

1 Requirement levels specified in this supplementary module of Tissue Paper and Tissue Products are to be applied.

2 Yankee chemicals refers to auxiliary chemicals used to improve manufacturing conditions such as adhesion and release of paper web on the Yankee cylinder.

O8 Softeners

Softeners that contain quaternary Imidazoline (CAS no. 72749-55-4) are exempt from classification as Aquatic acute 1 H400, Aquatic chronic 1 H410, Aquatic chronic 2 H411 and Aquatic Chronic 3 H412 in the requirement O1 in the Chemical Module (generation 3).

⇪ **The manufacturer/supplier of softeners** shall demonstrate compliance with the requirement in the web-based application tool, see also Appendix 1 in this Criteria document.

Background to the requirement

The requirement has been changed slightly to also include an exemption for the classification Aquatic Chronic 3 H412, as production chemicals classified as H412 are now prohibited in accordance with the Chemical Module, generation 3.

Softness is an important parameter in certain tissue products such as handkerchiefs and facial tissues. Imidazoline (CAS No. 72749-55-4) is often used in softeners and several suppliers have pointed out that there are no substitutes for these compounds. They are classified as hazardous to the aquatic environment meaning that these products cannot be used according to requirement for classification of production chemicals in the Chemical Module generation 3, where production chemicals classified as Aquatic acute 1 H400, Aquatic chronic 1-3 (H410, H411 and H412) are prohibited. Imidazoline quaternary-based products are widely used as softening agents, as this product is the only quaternary-based chemical approved according the German BfR's recommendation XXXVI. Paper and board for food contact[11].

O9 Chloro-organic substances in wet strength agents and in auxiliary chemicals

Wet strength agents must not contain more than 3500 ppm (0.35%) in total of the low-molecular chloro-organic compounds epichlorohydrin (ECH), dichloroisopropanol (DCP) and monochloropropanediol (MCPD) – calculated on the basis of the dry matter content.

Auxiliary chemicals* used on Yankee cylinders in tissue paper production must not contain more than 300 ppm (0.03%) in total of epichlorohydrin (ECH), dichloroisopropanol (DCP) and monochloropropanediol (MCPD).

Please note, that in accordance with requirement O7 in the Chemical Module, generation 3, alkylphenol ethoxylates and other alkylphenol derivatives must not be added to wet strength agents.

**An example of auxiliary chemicals used on Yankee cylinders are coating agents used to improve manufacturing conditions such as adhesion and release of paper web on the Yankee cylinder.*

[11] https://bfr.ble.de/kse/faces/resources/pdf/360-english.pdf

The manufacturer/supplier of wet strength agents and auxiliary chemicals shall demonstrate compliance with the requirement in the web-based application tool, see also Appendix 2 in this Criteria document.

Background to the requirement

The requirement for chloro-organic substances in wet strength agents (WSAs) and in auxiliary chemicals has been changed. The total limit value for the low-molecular chloro-organic compounds epichlorohydrin (ECH), dichloroisopropanol (DCP) and monochloropropanediol (MCPD) in wet strength agents has been tightened from 7000 ppm to 3500 ppm and from 500 ppm to 300 ppm in auxiliary chemicals, calculated on the basis of the dry matter content. In the Chemical Module, generation 3 (O7), the total limit value for these compounds in wet strength agents is 100 ppm (0.01%).

Wet strength agents are necessary in order to increase the strength of paper products when they come into contact with liquids. As such, they are relevant to the function of the product[12]. Wet strength agents are often used in kitchen towels, napkins and wipes.

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 MCPD, may be left in the paper product. DCP and MCPD are usually formed during synthesis and storage of epichlorohydrin (Braga et al, 2009)[13]. Both ECH and DCP have received a harmonised classification of Carc. 1B by ECHA, meaning that they may cause cancer[14,15]. MCPD 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[16]. 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.

A development toward lower levels of MCDP and DCP is ongoing, thanks in part to stricter requirements on these products' effect on health and the environment. Producing these products with lower impurities costs more, and thus these products are mainly used for specialty products, e.g. those intended to come into contact with food[17]. In previous revisions of these criteria, an attempt was made to lower the limit value to 1000 ppm. The market's response then was that these third-generation wet strength agents are available on the market, but not in a capacity to cover the volumes required to produce tissue paper. This generation of the criteria were sent out for public consultation with a proposed limit value of 3000 ppm. The response from the industry as well as tissue producers was again

[12] Reference document on Best available techniques in the Pulp and Paper industry, Integrated Pollution Prevention and Control (IPPC), December 2001
[13] 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
[14] https://echa.europa.eu/sv/substance-information/-/substanceinfo/100.003.128
[15] https://echa.europa.eu/sv/substance-information/-/substanceinfo/100.002.266
[16] https://echa.europa.eu/sv/brief-profile/-/briefprofile/100.002.267
[17] 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

that third-generation wet strength agents are not yet available to cover the required volumes for production of tissue paper. Furthermore, the stakeholders stressed that development of second-generation wet strength agents has been ongoing during the past years to reach a limit value of 3500 ppm. Nordic Ecolabelling therefore suggests a new limit value of 3500 ppm in this generation of the criteria, but this requirement will be of focus in the next revision, which is scheduled for 2025-2026.

Yankee chemicals are auxiliary chemicals used on the Yankee cylinder in order for the paper to adhere to, and then release from the Yankee cylinder, so their function is not to give the paper wet strength. These products can also contain impurities of ECH, and its reaction products MCPD and DCP, Nordic Ecolabelling therefore sets a requirement on the limit of these impurities in Yankee chemicals. An overview of these products in the Nordic Ecolabelling's chemical database shows that the content of these substances varies, but it is possible to produce them with a lower level than 500 ppm. Therefore, based on the data, a new limit value of 300 ppm is suggested.

O10 Additives in the finished product

The following additives are not permitted in the finished tissue product (including cores):

Perfumes

Perfumes and other fragrances are not permitted in the tissue product. Essential oils or plant extracts where the function is to provide scent are not permitted.

Cosmetic and body care additives (e.g. lotion)

Cosmetic or body care preparations and other scenting substances whose main function is other than to give the tissue product a scent must meet the requirements of the Nordic Ecolabelling for Cosmetic Products, generation 3 or later.

Cleaning agents

Cleaning agents designed for surface cleaning (e.g. floor cleaning) are not permitted in the tissue product.

The tissue product manufacturer shall declare compliance with the requirement in the web-based application tool.

If cosmetic and body care additives are used, **the tissue paper manufacturer** shall supply documentation which shows that the Nordic Ecolabelling Criteria for Cosmetic Products are fulfilled, see also Appendix 3.

Background to the requirement

The requirement for additives in the finished tissue product is unchanged. However, it is amended slightly in order to clarify that additives are not permitted in the finished tissue product, including cores. According to the product group definition, Nordic Swan Ecolabelled tissue paper and tissue products shall not include:

- Tissue products containing cleaning agents designed for the cleaning of surfaces (e.g. floor cleaning agents)
- Fragranced tissue product

- Cosmetic products within the meaning of Regulation (EC) No 1223/2009 of the European Parliament and of the Council (8), including wet wipes.

The motivation for banning perfume has been that perfume and other fragrances in the form of, for example, essential oils, vegetable oils and plant extracts often contain several allergens. To avoid unnecessary adverse health effects of these type of substances, the use of perfume and fragrances is completely prohibited. Furthermore, perfumes and fragrances have no function in connection with tissue products and are considered unnecessary. Demand for perfumed products in categories such as toilet paper is not so great in the Nordic region.

Cosmetic or body care preparations and fragrant substances whose main function is other than to give the paper product a scent can, however, be Nordic Swan Ecolabelled provided that the relevant chemical requirements of the Nordic Ecolabelling for Cosmetic Products, generation 3 or later are fulfilled.

Tissue products that have added cleaning chemicals with the intention for cleaning surfaces (e.g. cleaning chemicals for washing of floors or other surfaces) cannot be Nordic Swan Ecolabelled according to these criteria. This is consistent with the ban on the addition of cosmetic products to the tissue product. Cosmetic products including wet wipes can be labelled in accordance with the Nordic Ecolabelling for Cosmetic Products, generation 3 which specify that the paper material must fulfil the Nordic Swan Ecolabel or EU Ecolabel requirements on tissue paper.

O11 Tissue paper and tissue product in contact with food

Tissue paper and tissue product marketed for use in contact with food must comply with EU Regulation no. 1935/2004/EC on materials and articles intended to come into contact with food and be labelled as such according to article 15 of EU regulation no. 1935/2004/EC.

Furthermore, kitchen towels and napkins must also comply with BfR's recommendation XXXVI. Paper and board for food contact, April 2021 or more recent versions.

⇪ **The tissue paper and tissue product manufacturer** shall enclose confirmation from an independent third-party that the regulation and guidelines are followed.

⇪ **The tissue product manufacturer** shall enclose sample of information printed on the product's exterior packaging.

Background to the requirement

The requirement for paper in contact with food is changed. Paper marketed for use in contact with food must comply with EU Regulation no. 1935/2004/EC on materials and articles intended to come into contact with food. In addition, Nordic Swan Ecolabelled kitchen towels and napkins must comply with BfR's recommendation XXXVI. Paper and board for food contact, April 2021 or more recent versions. In the previous generation 5, the Council of Europe "Guidelines for tissue paper kitchen towels and napkins", version 1 (22.09.2004) was followed. It is now replaced by the updated version of BfR's recommendation.

EU Regulation 1935/2004/EC is to be fulfilled by all materials and articles intended to come into contact with food. Tissue products like kitchen towels, napkins and wipes used in a food environment can reasonably be expected to be

brought into contact with food (mainly used for cleaning and absorption)[18]. For paper products, no statutory requirements are made, other than EU Framework Regulation 1935/2004. None of the Nordic countries have comprehensive requirements for paper,[19] except for individual requirements such as e.g. the ban on fluorinated substances in paper and board food contact materials in Denmark[20]. It is therefore important that paper that comes in contact with food is safe to use.

In the previous generation, tissue paper marketed in contact with food had to comply with the Council of Europe's Tissue Guideline. Analysis of license data, however, showed that most of the tissue paper marketed for use in contact with food followed BfR's recommendation XXXVI. BfR's recommendation is a German legislation that regulates paper for food contact, including tissue. It is widely used in many countries without specific legislation for paper. The requirement has now been changed to include BfR's updated recommendation in order to give further reassurance that the product that is marketed for use in contact with food is safe to use. See also the following requirement O12 for content of harmful substances and bleeding.

O12 Content of harmful substances and bleeding

This requirement is divided into tissue paper and tissue products manufactured from different fibres:

Table A) only applies to recycled fibre or mixes of recycled and virgin fibre and

Table B) applies to all fibre types, including virgin fibre, recycled fibre or mixes of virgin and recycled fibre.

Table A) Maximum permitted content for tissue paper and tissue products that contain recycled fibres:

Parameter	Limit	Test method
Formaldehyde	1 mg/dm2	EN 1541 – aqueous extract
Glyoxal	1.5 mg/dm2	DIN 54603
PCB	0.05 mg/kg	EN ISO 15318
PCP	0.15 mg/kg	EN ISO 15320
Total organic fluorine*,**	20 mg/kg	EN ISO 10304-1 (D20) or equivalent standard***
Migration of bisphenol A, F, S*	0.05 mg/kg foodstuff****	EN 645

* Applied to kitchen towels, napkins and all other tissue products marketed for use in contact with food.
** The content of inorganic fluorine compounds is subtracted from the results of the TOF analysis.
*** Equivalent standard must be approved by Nordic Ecolabelling.
**** Limit value for each individual substance

Table B) The following requirements apply to all tissue paper and tissue products covering all fibre types:

Parameter	Test methods and levels

[18] http://www.perinijournal.it/Items/en-US/Articoli/PJL-29/Product-safety-for-tissue-products-the-European-perspective
[19] European Commission, Summary of the national legislation, Sanco E6/MS(28/09/2010):http://ec.europa.eu/food/food/chemicalsafety/foodcontact/documents_en.htm
[20] https://www.foedevarestyrelsen.dk/english/SiteCollectionDocuments/Kemi%20og%20foedevarekvalitet/UK-Fact-sheet-fluorinated-substances.pdf

Slimicides and anti-microbials	No growth inhibiting effects arising from micro-organisms according to test method EN 1104.
Optical brighteners	No bleeding according to test method EN 648, latest version, level 4 or 5*
Dyes and printing inks (when relevant)	No bleeding according to test method EN 646, latest version, level 4 or 5*

* Please note that for tissue paper and products that are required to follow BfR XXXVI (O11), the level required in BfR XXXVI must be fulfilled.

The requirement must be documented on application, with subsequent annual checks via self-assessment.

⇪ **The tissue paper manufacturer** shall enclose test results and test reports from an independent third party. Testing shall comply with the methods described in the requirement.

⇪ **The tissue paper manufacturer** shall enclose a written procedure showing how an annual test is performed in line with the requirement, along with annual in-house checks of compliance with the requirement.

Background to the requirement

The requirement is changed slightly. For tissue paper and tissue products manufactured from recycled fibre, a maximum permitted content of total organic fluorine (TOF) and Bisphenol A, F and S has been added. This applies to tissue products marketed in contact with food. There is also a new clarification that the requirement must be documented on application, with subsequent annual checks via self-assessment.

Recycled fibre may contain substances harmful to health originating from a variety of paper products entering the paper recycling system. It is likely that as use of printing paper, newspaper and magazines declines, more and more other paper grades will end up as recycled fibre. It is important that tissue products do not contain components that can be transmitted to the user or food. Therefore, Nordic Ecolabelling sets a requirement on the content of harmful substances that may be present in the recycled fibre raw material.

One of the key aspects that should be addressed under tissue product requirements is product safety. Tissue products are multi-purpose use products, that may not be specifically intended for contact with foodstuffs but might be used for this purpose, as discussed in requirement O11 above. Skin safety shall be considered for tissue that comes into direct contact with the body. Examples are handkerchiefs, facials, toilet paper and the like, so-called sanitary paper. There is no European legislation or recommendation for sanitary papers. In Germany, the BfR has published “Guidelines for Evaluating Sanitary Papers”[21]. The testing of harmful substances and bleeding in requirement O12 is originally based on recommendation of BfR's Guidelines but have been extended over the years in the Nordic Swan Ecolabel Criteria.

[21] https://bfr.ble.de/kse/faces/resources/HYGENGLISCH.pdf

Bisphenol A is a contaminant of recycled paper[22]. Bisphenol F and S can be used as a substitute for bisphenol A; therefore, Nordic Ecolabelling has introduced a prohibition of these three bisphenols as contaminants in tissue products based on recycled fibre on the basis of the precautionary principle and the suspicion that these substances may be endocrine disruptors[23].

PFAS is a wide group of substances that are highly persistent, of which several have been identified as harmful both to the environment and to human health. PFAS substances have widespread use in paper products that need to be fat and water resistant[24]. These products enter the recycling system and PFAS compounds are then found in recycled fibre. In 2020, Denmark passed into law that food contact materials (FCM) must not contain PFAS, regardless of whether it has been added directly to the material or if its presence comes from the use of recycled fibre in the FCM.

The presence of PFAS is determined using a so called TOF (Total Organic Fluorine) analysis, with an indicator value of 20 mg/kg. This indicator value is set, as content below this value is considered unintentional background pollution. It is important that the content of inorganic fluorine compounds is subtracted from the results, otherwise a false positive result can be obtained.

Furthermore, the content of organic fluorine can also be determined via an EOF (Extractable Organic Fluorine) analysis[25]. Equivalent standards that measure the total content of organic fluorine may be used, but must be approved by Nordic Ecolabelling.

3.6.2 Product function

O13 Absorption properties of kitchen towel and paper towels

Kitchen towel and paper towels (both sheet and rolls) must have an absorption capacity of at least 5g water/g paper, measured over 30 seconds according to test method ENV 12625-8:2010. The test is to be performed on the converted product.

The tissue product manufacturer shall enclose test result according to test method ENV 12625-8:2010.

O14 Strength/perforation of kitchen towel

The ratio between the strength of the paper longitudinally and over the perforation must be at least 2 according to EN 12625-4:2016. The test must be conducted on the converted product. The requirement does not apply to kitchen rolls without perforation.

The tissue product manufacturer shall enclose test results according to EN 12625-4:2016.

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[22] Liao C, Kannan K. Widespread occurrence of bisphenol A in paper and paper products: implications for human exposure. Environ Sci Technol. 2011 Nov 1;45(21):9372-9. doi: 10.1021/es202507f. Epub 2011 Oct 5. PMID: 21939283.

[23] Johanna R. Rochester and Ashley L. Bolden Bisphenol S and F: A Systematic Review and Comparison of the Hormonal Activity of Bisphenol A Substitutes Environ Health Perspect; DOI:10.1289/ehp.1408989 https://pubmed.ncbi.nlm.nih.gov/25775505/

[24] https://www.kemi.se/kemiska-amnen-och-material/hogfluorerade-amnen---pfas

[25] https://www.foedevarestyrelsen.dk/english/SiteCollectionDocuments/Kemi%20og%20foedevarekvalitet/UK-Fact-sheet-fluorinated-substances.pdf

O15 Toilet paper

Toilet paper must not possess wet strength. The toilet paper is considered to be strong when wet if its relative wet tensile strength is greater than 10% in the machine direction. The test must be conducted on the converted product.

Relative wet tensile strength is measured as the quotient between wet and dry tensile strength. If the tensile strength of the wet tissue paper is so low that it cannot be measured the paper is not considered to have wet strength.

The tissue product manufacturer shall enclose test results. Measurement of tensile strength is to be carried out according to a standardized and reproducible method.

Description of method and routines for ensuring that the toilet paper does not have wet strength in those cases in which production lines switch between the manufacture of paper with and without wet strength.

Background to the requirements

The requirements for tissue products function are unchanged. During the previous revisions of the criteria, the product's function has been discussed. Good quality, i.e. the functional properties, are important as good function of a tissue can be thought to save resources. For example, a good absorption capacity can lead to a smaller amount of household paper being needed to dry up liquids. Possibilities of setting requirements for the product's function and which properties are the most relevant were discussed also during current revision work. The function tests remained, however, unchanged because no new and applicable tests emerged in discussions.

3.7 Packaging

O16 Recycled raw material in primary packaging

The requirement covers primary packaging* for the Nordic Swan Ecolabelled tissue product.

**Primary packaging means the packaging that stays with the Nordic Swan Ecolabelled product all the way to the customer, also including smaller resealable handkerchief packs within the packaging. Stretch film for base paper is out of scope of the requirement.*

Plastic packaging

Plastics must contain at least 30% recycled** plastics.

Exemptions apply to:

- Packaging of napkins and handkerchiefs made from polypropylene

Paper packaging

Paper packaging refers to all paper-based packaging (paper, board etc.). On an annual basis,

1. A minimum of 70% of the fibre raw material that is used in the paper packaging shall originate from forestry certified under the FSC or PEFC schemes,

   or

2. The paper packaging 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 packaging contains both recycled and certified fibres, the sum of these fibres shall in total be a minimum of 70%.

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

** *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.

The tissue product manufacturer shall enclose a description of the material composition of the packaging e.g. in the form of technical data sheets. Appendix 4 Declaration from the manufacturer(s) of the packaging can be used as part of the documentation.

Background to requirements

The requirement is new. The environmental impact of packaging is usually small compared to that of the tissue product itself. Therefore, there has only been a few requirements on packaging in the previous generations of the criteria, consisting mainly of a ban on PVC and optimisation of packaging from a transport perspective, which has now been removed (see also chapter 5 Areas that are not subject to requirements).

The new requirements for the use of recycled material in packaging and recyclability of packaging are in line with the EU Circular economy action plan[26]. The EU's action plan focuses on recovery and reuse, particularly with regard to packaging materials. Nordic Ecolabelling has an opportunity to promote the recycling of packaging by setting requirements that support this process. By setting requirements for using recycled material in packaging, the Nordic Swan Ecolabel promotes a transition to materials with a lesser impact on the climate. The material in the packaging must also be recyclable. This provides an opportunity for materials to stay in the resource eco-cycle, thereby reducing the use of virgin resources.

For primary packaging made of paper, the fiber raw material must come from at least 70% certified sources or be recycled or a combination of both. Plastic packaging must contain at least 30% recycled material. The requirement has been changed after consultation, from initially 50% recyled material in plastic packaging, which would have risen to 75% in 2025. This was done due to responses regarding the lack of recycled plastic raw material in such high

[26] https://ec.europa.eu/environment/topics/circular-economy/first-circular-economy-action-plan_fi

volumes, as well as technical difficulties with plastic packaging with such high recycled content. The amount of recycled material in plastic packaging will be of focus during the next revision, which is scheduled for 2025-2026.

Furthermore, the requirement has been changed after consultation regarding requiring 100% recycled fibre raw material in paper packaging. Responses have concerned technical difficulties and product safety, and a requirement on 100% recycled raw material in paper packaging would effectively eliminate the development of this new type of packaging. Therefore, the same requirement is set on fibers in the primary packaging as is set on certification of fibers in the tissue product in this generation of the criteria. The term paper packaging is used in the requirement but it generally refers to all paper-based packaging (paper, board etc.).

After public consultation, an exemption has been introduced for polypropylene in plastic packaging. There is a lack of recycled polypropylene on the market, whereby such packaging would not be able to meet the requirement. It is also clarified that stretch film for base paper (sold B2B) is not in the scope of the requirement O16.

O17 Chlorinated plastic

Chlorinated plastic e.g. polyvinyl chloride (PVC) and polyvinylidene chloride (PVDC) must not be used in the packaging (article, group or transport packaging).

The tissue product manufacturer shall decare that chlorinated plastic is not used in the packaging. Appendix 4 Declaration from the manufacturer(s) of the packaging can be used as part of the documentation.

Background to the requirement

PVC (polyvinyl chloride) and PVDC (polyvinylidene chloride) must not be used in the packaging. The environmental impact of PVC is associated primarily with emissions of harmful organic chemicals from the entire production chain, use of endocrine disrupters such as phthalates as plasticizers in soft PVC and challenges with waste management during production and end of life.

O18 Recyclable packaging material in the primary packaging

It shall be possible to recycle* the main material** in the primary packaging via the existing recycling systems in the Nordic countries today. Furthermore, primary packaging made of plastic must be made of mono-materials***.

** Incineration for energy recovery is not classed as material recycling. Biodegradable/compostable/oxo-degradable plastics cannot be recycled at today's recycling facilities.*

*** The main material is defined as the material that makes up 90 wt% or more of the total packaging.*

**** A mono-material is defined as material components that are not composed of multiple material types, e.g. the same plastic type and cardboard are monomaterials.*

The tissue product manufacturer shall demonstrate compliance with the requirement by enclosing a description of the main material in the packaging and how the material can be recycled in existing waste and resource systems in the Nordic region. Appendix 4 Declaration from the manufacturer(s) of the packaging can be used as part of the documentation.

Background to the requirement

The requirement is new. Primary packaging must be made from mono-material and be recyclable via the existing waste systems operating in the Nordic region. Incineration with energy recovery is not considered as material recovery.

Recyclability is an important step in the transition to a circular economy. This provides an opportunity for materials to stay in the resource eco cycle, thereby reducing the use of virgin resources. The extent to which a material is recycled depends on many factors, such as the sorting options in each country or local authority, and how the consumer ultimately sorts the waste. However, Nordic Ecolabelling has an opportunity to promote the recycling of packaging by setting design requirements that support this process.

It is also emphasized in the requirement that plastic packaging must be made of mono-materials. Packaging of tissue products are usually made of mono-materials, which is the best way to ensure high quality recycling, as multilayered plastics are not possible to recycle.

Bio-based plastics can also be used in packaging but oxo-degradable and biodegradable plastics must not be used since they “contaminate” the other recycled plastics streams in the Nordic region. Bio-based plastic in PET, PE and PP can be recycled in the same way as fossil-based plastic in PET, PE, and PP.

O19 Information on recycling

The packaging shall carry information on how it can be sorted for recycling. This information shall be stated using text or symbols.

⇪ **The tissue product manufacturer** shall enclose sample of information printed on the product’s exterior packaging.

Background to the requirement

To stimulate the sorting of packaging for recycling, a new requirement has been introduced concerning the information on the packaging on how it should be sorted for recycling. The waste stage is affected by many factors, such as the sorting options in each country or local authority, and how the consumer ultimately sorts the waste. However, Nordic Ecolabelling can generally encourage greater recycling of packaging by setting requirements that support recycling options.

4 Licence maintenance

The purpose of the licence maintenance is to ensure that fundamental quality assurance is dealt with appropriately.

O20 Customer complaints

The licensee must guarantee that the quality of the Nordic Swan Ecolabelled product does not deteriorate during the validity period of the licence. Therefore, the licensee must keep an archive over customer complaints.

Note that the original routine must be in one Nordic language or in English.

⇪ Routines for handling and archiving customer complaints.

Background to the requirement

Nordic Ecolabelling requires that your company has implemented a customer complaint handling system. To document your company's customer complaint handling, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for customer complaint handling, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the customer complaint handling is implemented in your company as described. The customer complaints archive will also be checked during the visit.

O21 Traceability

The licensee must be able to trace the Nordic Swan Ecolabelled products in the production. A manufactured / sold product should be able to trace back to the occasion (time and date) and the location (specific factory) and, in relevant cases, also which machine / production line where it was produced. In addition, it should be possible to connect the product with the actual raw material used.

⇪ Description of the mill's traceability system/routines for the fulfilment of the requirement.

Background to the requirement

Nordic Ecolabelling requires that your company has implemented a traceability system. To document your company's product traceability, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for product traceability, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the product traceability is implemented in your company as described.

O22 Annual follow-up

Every year a follow-up of the environmental requirements must be made in line with instructions from Nordic Ecolabelling, see also requirement O16 in the Basic Module, generation 3 or later.

Nordic Ecolabelling may examine a selection, or all, of the requirements.

5 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.

Structured paper

Structured paper has been incorporated in the EU Ecolabel Criteria for Tissue Paper and Tissue Products during the last revision. Tissue that is manufactured with the use of TAD (through air drying) or a hybrid process is denominated

structured tissue, being characterized by a high bulk and absorbance capacity[27]. However, the split view was observed if, or if not, EU Ecolabel should accommodate structural paper[28]. Given the growing market share, and high quality of the product obtained, supported by saving in quantity of fibre used, it was proposed to incorporate structural paper into the EU Ecolabel scheme.

In previous revision of Nordic Swan Ecolabel criteria, it was also discussed whether the structured paper can be Nordic Swan Ecolabelled or not. In the current Tissue Paper Criteria, generation 5, TAD technology is shortly mentioned in the energy requirement (O4): the same reference values for energy, as used for conventional tissue machine, shall be used for tissue products that are manufactured using TAD technology. In practice, there have been no licences since energy consumption in structural paper manufacturing is clearly higher than in conventional tissue manufacturing. Reference values given in the EU Ecolabel Criteria for fuel and electricity today are 3000 kWh/ADt and 1500 kWh/ADt for structured paper, whereas 1 950 kWh/ADt and 950 kWh/ADt for conventional tissue paper. As the key focus in this Nordic Swan Ecolabel revision of the criteria for tissue paper has been on reduced energy consumption including reduced emissions of greenhouse gases, it is not relevant to extend the product group with structured paper.

Water consumption

A requirement for reducing water consumption in the tissue paper mill was discussed during the current revision. According to the BAT Bref[29], the volume of water used in a tissue mill may appear high or vary greater than for some other paper mills. In tissue paper mills, reported values for fresh water use in 29 non-integrated mills ranged from 2 m^3 /tonne to 42 m^3 /tonne[30]. In tissue paper mills, high levels of cleanliness are required for the product itself (hygienic use) and for tissue machine clothing. Water use also varies due to other parameters such as a light weight product, change of basis weight and speed of the paper machine. Generally, in mills that manufacture a lesser variety of products, with fewer colours, fewer wet or dry strength agents or on large machines, the water consumption will be lower and vice versa.

As a result, a requirement for water consumption was not included in the criteria mainly due to large variations in manufacture on the tissue machine. However, the requirement on emissions to water such as COD can be regarded as an indirect requirement for water consumption since water consumption and emissions are inter-related.

Design of the packaging

The requirement that packaging must be optimised from a transport perspective has been removed from generation 6 of the Tissue Paper Criteria. Optimization from a transport point of view, by for example, placing group packaging on the pallet to increase the degree of filling of the pallet in the vehicle, is already done by several producers of tissue paper. The requirement has been removed in this

[27] tissue_paper_tr_2019.pdf (europa.eu)
[28] tissue_paper_tr_2019.pdf (europa.eu)
[29] https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/PP_revised_BREF_2015.pdf
[30] https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/PP_revised_BREF_2015.pdf

generation 6 of the Criteria as it is considered to have no potential to increase environmental benefit.

Changes compared to previous generations

Overview of changes to criteria for Tissue Paper and Tissue Products, generation 6 compared with previous generations 5 and 4 is presented in Table 4 below. Comparison of Nordic Swan Ecolabel and EU Ecolabel requirement levels for tissue paper is also included in the table.

Table 4 Overview of changes to Nordic Ecolabelling (NE) criteria for Tissue paper and tissue products, generation 6 compared with previous generations 4 and 5. Comparison of Nordic Swan Ecolabel and EU Ecolabel requirement levels in also presented.

Requirement	Nordic Ecolabelling – Tissue Paper, generation 4, 2006	Nordic Ecolabelling – Tissue Paper, generation 5, 2011	Nordic Ecolabelling – Tissue Paper and Tissue Products, generation 6, 2022	EU Ecolabel, Tissue Paper and Tissue Products criteria adopted 11 January 2019
Product definition	Cellulose-based tissue paper made from virgin and/or recovered fibres	Cellulose-based tissue paper made from virgin and/or recovered fibres	Cellulose-based tissue paper made from virgin and/or recycled fibres	Tissue paper and tissue products, structured paper included within the scope of the criteria
Fibres				
Fibre raw material	20% certified fibre raw material or 75% recovered fibre	30% certified[31] fibre raw material or 75% recycled fibre Assessment of forestry standards[32]	70% certified[33] or recycled fibre in paper, allocated to paper/production line. New req. for pulp: fibre from euca or acacia must be 70% certified. New fibre requirement for cores.	70% certified fibre raw material or recycled fibre
Fibre raw material	Traceability requirements for all wood and fibre raw materials	Pulp and paper mills must be COC certified. Traceability requirements for all wood and fibre raw materials	Pulp and paper mills must be COC certified. List of restricted tree species not allowed to be used in NSE paper	CoC certificate, balance sheet for calculation of the 70% cert. fibre in the EU Ecolabelled paper
Chemicals[34]				
Exclusion list, Restrictions on substances of very high concern (SVHC)	No	No	Ban on substances in the Candidate List in concentrations greater than 0,1% (w/w), applied to production chemicals used	Ban on substances in the Candidate List in concentrations greater than 0,10% (w/w), applied to the paper product
General prohibition of classified chemicals	No	Yes, applied to production chemicals used.	Yes, applied to production chemicals used. The new classification category have been introduced (H412)	Yes, applied to chemicals that remain in the paper product (0,10% w/w)
Alkylphenol ethoxylates (APEOs)	Prohibited in specific chemical groups	Prohibited in specific chemical groups	Prohibited in specific chemical groups	Prohibited in specific chemical groups

[31] In addition to wood fibres, Nordic Ecolabelling permits the use of bamboo, cotton linters, linen and flax.
[32] Nordic Ecolabelling stipulates strict requirements in respect of standards according to which forestry must be certified
[33] FSC or PEFC
[34] In EU Ecolabel criteria wastewater treatment chemicals excluded unless the treated wastewater is recirculated back into the process. Pulp chemicals not included in the EU Ecolabel Criteria.

De-inking chemicals	Yes	As previous	Yes, slightly amended. All surfactants used must be readily or inherently biodegradable.	Yes
Biocides	Yes	As previous	Yes, slightly amended. Now includes reference to regulation (EC) No 528/2012	Yes, includes reference to regulation (EC) No 528/2012
Residual monomers	Yes Acrylamide limit 700 ppm	New requirement on classified residual monomers. Ban on bisphenol A.	See the Exclusion list above, Acrylamide limit 1000 ppm	Removed
Foam inhibitors	Yes	As previous	Yes, slightly amended	No
Wet strength agents (WSAs)	Yes, 0,7% for total of ECH, DCP and CPD in WSAs, for Yankee auxiliary chemicals 0,05%, respectively	As previous	Yes, amended. 0,35% for total of ECH, DCP and MCPD in WSAs, 0,03% for Yankee auxiliary chemicals	Yes, 0,35% for total of ECH, DCP and CPD in WSAs, for Yankee auxiliary chemicals 0,05%, respectively
Softeners	No	Yes, exemption to imidazoline classified as environmental hazardous	Yes, exemption to imidazoline classified as environmental hazardous including also H412	No
Bleaching agents	Chlorine gas prohibited	As previous	As previous	Chlorine gas prohibited
Dyes for printing and colouring	Yes	New requirement on classified constituent substances	Removed, included in req. for classified chemicals in the Chemical Module, v3	Included in req. on classified substances
Heavy metals in pigments and dyes	Yes	Clarification of requirement on heavy metals	Metals included, harmonised partly with EU Ecolabel	Yes
Impurities in dyes	Pb, Hg, Cr and Cd under 100 ppm	As previous	Harmonised with EU Ecolabel	Yes
Phthalates	Prohibited	As previous	As previous	No
Amines/Azo dyes	Yes	As previous	Yes, clarified that the requirement regards azo dyes, link to Regulation (EC) No 1907/2006 Annex XVII, Appendix 8	Yes
Adhesives	Yes	As previous	Yes, slightly amended. Now regards only those ethylene glycol ethers that are classified	No
GMO starch	No	Yes, prohibited	As previous	No

Emissions to air / water				
Score - emissions of COD, P, S and NOx	Yes, individual emissions <1.5, Total <4	As previous	Individual emissions points <1.3, Total <4	Individual emissions points <1.3, Total <4
COD, P, S and NOx	2.0 kg/ADt for COD, 0.01 for P, 0.3 kg/ADt for S and 0.29 g/kWh for NOx	1.5 kg/ADt for COD, 0.01 for P, 0.2 for S and – a new reference value for NOx: 0.5 NOx kg/ADt	1.2 kg/ADt for COD, 0.007 for P, 0.15 for S and 0.5 for NOx kg/ADt	1.2 kg/ADt for COD, 0.01 for P, 0.3 for S and 0.5 for NOx kg/ADt
AOX	Weighted average from used pulps <0.15 kg/t, special products 0,25 kg/t; Each individual pulp <0.25 kg/t	Weighted average from used pulps <0.17 kg/t Each individual pulp <0.25 kg/t	Weighted average from used pulps <0.14 kg/t in paper, each individual pulp <0.16 kg/t	<0.17 kg/t for each individual pulp
Chelating agents	Yes	Yes	Removed	No
CO_{2e}	700 kg/tonne tissue paper machine (pulps not included), applied to fuels used for production of process heat (Basic Module, generation 1)	1100 kg/tonne tissue paper Applied to fuels and purchased electricity	525 kg/ADt tissue paper Applied to fuels and electricity used for production of process heat	1 200 kg/tonne for conventional tissue paper 1 850 kg/tonne paper for structured tissue paper
CO_{2e}, transport	No	CO_{2e} from transport (from forest to mill)	Removed	No
Energy				
Score	Score $P_{electricity}$<1.75 and $P_{energytotal}$: $(P_{electricity}+P_{fuel})/2<1.25$	Score $P_{electricity}$ ≤1.15 Score P_{fuel}≤1.15	Score $P_{electricity}$ ≤2.3 Score P_{fuel} ≤2.3 Refer to calculation method changed in the Basic Module	$P_{total}=P_E+P_F$ shall not exceed 2.5
Fuel (heat)	2011 kWh/t	1800 kWh/t	1750 kWh/ADt	1950 kWh/ADt
Electricity	1586 kWh/t	1030 kWh/t	900 kWh/ADt	950 kWh/ADt
Waste				
Sorting of waste	Yes	As previous	Yes	Yes
Packaging				
Packaging material and recyclability	Yes, recyclable, ban on PVC, optimized from transport perspective	As previous	Yes, amended, content of recycled material in packaging, recyclability of packaging, monomaterials, transport optimisation removed	No
Information -Sorting of packaging	No	No	Yes, information to consumers regarding recycling of packaging	No

Product				
Fitness for use	No	No	No	Yes
Product function: absorption, strength/perforation, wet strength	Yes	As previous	As previous	No
Product safety: harmful substances and bleedingFitness for use	Yes, formaldehyde, glyoxal, PCB, slimicides and antimicrobial substances, optical brighteners and dyes and printing	Yes, formaldehyde, glyoxal, PCB, PCP, slimicides and antimicrobial substances, optical brighteners and dyes and printing	Yes, formaldehyde, glyoxal, PCB, PCP, slimicides and antimicrobial substances, optical brighteners and dyes and printing. New tests regarding total organic fluorine and Bisphenol A, F, S that apply to tissue products marketed in contact with food as well as to all kitchen rolls and napkins	Formaldehyde, Glyoxal, PCP, slimicides and antimicrobial substances, optical brighteners and dyes
Additives in finished product	Yes, perfumes forbidden	Yes, perfumes and cleaning agents forbidden:	As previous	Perfumes and cleaning agents forbidden
Paper in contact with food	No	Yes, follow Council of Europe guidelines (2004)	Yes, amended, kitchen rolls and napkins must follow BfR XXXVI	No