

Nordic Ecolabelling for
Construction and facade panels



Version 7.0 • 13 October 2022 – 09 December 2022

Consultation

NB - The consultation only includes requirements for renewable materials and products based on renewable raw materials

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

Addresses

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

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What is a Nordic Swan Ecolabelled Construction Panels and Mouldings, based on renewable materials?

Nordic Swan Ecolabelled panels, mouldings and glulam products from renewable materials fulfil strict requirements concerning the constituent raw materials, the chemicals used in production and surface treatment, emissions of substances harmful to health and energy consumption in production.

A Nordic Swan Ecolabelled construction panel, moulding or glulam product from renewable materials:

- The wood is legally harvested and is certified under a Chain of Custody, or traceability, system.
- At least 70% of the wood is sourced from certified sustainable forests or recycled raw material.
- Stringent requirements governing chemicals that are used during manufacture panels and for surface treatment. For example, antibacterial substances and halogenated flame retardants must not be applied to a Nordic Swan Ecolabelled panel or moulding.
- Meet stringent requirements governing the release of hazardous substances. This is positive for the indoor environment.
- Requirements governing energy consumption in production deliver a reduction in carbon emissions.
- Fulfil all requirements in the criteria for Nordic Swan Ecolabelling of buildings and of renovation.

Why choose the Nordic Swan Ecolabel?

- The manufacturer may use the Nordic Swan Ecolabel trademark in its marketing. The Nordic Swan Ecolabel is a very well-known and well-reputed trademark in the Nordic region.
- The Nordic Swan Ecolabel is an easy way to communicate your environmental work and commitment to your customers.
- The Nordic Swan Ecolabel highlights the key environmental impacts, and thus shows how the business can reduce emissions, resource consumption and waste impact.
- More environmentally aware production makes a company better placed for future environmental requirements from the authorities.

- The Nordic Swan Ecolabel can be seen as a guide to working on environmental improvements in the business.
- The Nordic Swan Ecolabel covers not only environmental but also quality requirements, since the environment and quality often go hand in hand. This means that a Nordic Swan Ecolabel licence can also be seen as a mark of quality.

What can carry the Nordic Swan Ecolabel?

Products that may be ecolabelled in this product group (draft for consultation) must consist of renewable raw materials* and be intended for indoor use. The products must fall into one of the categories below:

1. Wood-based panels covered by the standard EN 13986 (Wood-based panels). Characteristics, evaluation of conformity and marking) in classes 1 and 2. The products that can be labelled are mainly for indoor use, but category 2 (protected external) products can also be labelled if they do not contain chemicals that make them resistant to biological attacks, e.g., from fungi and insects.
2. Melamine faced board that is covered by the standard EN 14322 (Wood-based panels – Melamine faced boards for interior uses).

The wood-based panels can have different applications such as walls, subfloors, ceilings, as well as being used in the production of furniture and interior design.

Examples of wood-based panels included:

- *Particleboard*
 - *MDF (Medium Density Fibreboard)*
 - *HDF (High Density Fibreboard)*
 - *MFB (Melamine Faced Board)*
 - *Plywood*
 - *OSB (Oriented Stranded Board)*
 - *LVL (Laminated Veneer Lumber)*
 - *SWP (Solid Wood Panel), Kerto LVL products are CE marked according to standard EN 14374.*
3. Laminate such as HPL (High Pressure Laminate) or compact laminate according to the EN 438 series. Only laminates for indoor use can be labelled according to these criteria**.
 4. Panels made of renewable materials other than wood, e.g. straw or linen, for indoor use in buildings/structures, furniture and interior fitments.
 5. Panels and mouldings, either of solid wood or consisting of the panel types indicated in any of the other points for indoor use. Panels and mouldings can be either untreated or surface-treated with e.g., varnish or paint.

6. CLT (cross laminated timber) according to EN-16351 for indoor use

7. Glulam (glued laminated timber) according to EN-14080 for indoor use

** Renewable raw material means a raw material that derives from biological materials that are continually being renewed in nature within a short number of years, such as grain and trees. It also includes products made from renewable raw materials such as paper. NB: in these criteria (draft for consultation), only the use of recycled material from renewable materials is permitted. Chemicals such as adhesives and surface treatments, as well as thin plastic foils, are exempted. This means that the raw material in the form of wood, paper or other renewable raw materials determines whether the panel is included in the product group and can carry the Nordic Swan Ecolabel.*

The product group does not include the following products:

- Outdoor panels (includes class 3 of EN 13986). Panels that are for outdoor use, consist of non-renewable materials or a mixture of renewable and non-renewable materials, e.g. cement-based panels, can be labelled according to the criteria for Construction and facade panels, and mouldings, generation 6**, until revised criteria for these panel types are available.
- Panels consisting of non-renewable materials or a mixture of renewable and non-renewable materials, e.g. plasterboard or fibre cement panels. can be labelled according to the criteria for Construction and facade panels, and mouldings, generation 6**.
- Panels that have an insulating function against heat or cold losses. Panels marketed as insulation panels or insulation products are therefore not included.
- Wet room panels
- Fully prefabricated wall elements
- Flooring. Flooring can be labelled according to the criteria for Nordic Ecolabelling of Floor coverings**.
- Kitchen worktops. Worktops for kitchens and bathrooms can be labelled according to the criteria for Nordic Ecolabelling for Furniture and fitments**.

** See <https://www.nordic-ecolabel.org/product-groups>

Nordic Ecolabelling determines whether or not a product can be Nordic Swan Ecolabelled, and under which criteria a product can apply for a licence.

If there are other types of panels or products, based on renewable raw materials and used in buildings, furniture and fitments, that are not mentioned in the

product group definition, and there is a desire for such products to be Nordic Swan Ecolabelled, an assessment may be made as to whether these can also be included. Nordic Ecolabelling will determine which new products may be included in the product group.

How to apply

Application and costs





For information about the application process and fees for this product group, please refer to the respective national web site. For addresses see page 3.

What is required?

The application consists of a web form and documentation showing that the requirements are fulfilled.

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

The text describes how the applicant shall demonstrate fulfilment of each requirement. There are also icons in the text to make this clearer. These icons are:

-  Enclose
-  Upload
-  State data in electronic application
-  Requirement checked on site

All information submitted to Nordic Ecolabelling is treated confidentially. Suppliers can send documentation directly to Nordic Ecolabelling, and this will also be treated confidentially.

Licence validity

The Nordic Swan Ecolabel licence is valid providing the criteria are fulfilled and until the criteria expire. The validity period of the criteria may be extended or adjusted, in which case the licence is automatically extended and the licensee informed.

Revised criteria shall be published at least one year prior to the expiry of the present criteria. The licensee is then offered the opportunity to renew their licence.

On-site inspection

In connection with handling of the application, Nordic Ecolabelling normally performs an on-site inspection to ensure adherence to the requirements. For such an inspection, data used for calculations, original copies of submitted certificates,

test records, purchase statistics, and similar documents that support the application must be available for examination.

Queries

Please contact Nordic Ecolabelling if you have any queries or require further information. See page 3 for addresses. Further information and assistance (such as calculation sheets or electronic application help) may be available. Visit the relevant national website for further information.

1.1 Terms and definitions

Words/Terms	Definitions
ADt	ADt is dry, solid content of pulp and paper. ADt for pulp is 90%, while ADt for paper means a solid content of 94%.
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora. CITES is an international convention for the control of trade (across borders) in wild fauna and flora at risk of extinction.
CoC	Chain of Custody – certification that ensures traceability in the supply chain.
COD	Chemical oxygen demand. A measure of how much oxygen is used during chemical degradation of organic matter.
Decor paper	Decor papers enable surface upgrades for wood-based substrates for use in the production of furniture, laminate flooring and other interior and exterior design panels.
Dry conditions (Service Class 1)	Conditions corresponding to Service Class 1 of EN 1995-1-1 (Eurocode 5) which are characterised by a moisture content in the material corresponding to a temperature of 20°C and a relative humidity in the surrounding air only exceeding 65% for a few weeks per year.
Self-generated energy	Self-generated energy refers to energy (electricity and heat) not purchased from an external supplier. For example, if the panel production has an energy surplus that is sold as electricity, steam or heat, the sold amount can be deducted from the energy consumption. Internally produced fuel sources and residual products are not regarded as self-generated energy.
FSC	Forest Stewardship Council Certification scheme for forestry and traceability in the supply chain.
Recycled material from renewable materials	Recycled material is defined under ISO 14021 in the categories of pre-consumer and post-consumer and includes both mechanical and chemical recycling. "Pre-consumer" is defined as material that is reclaimed from the waste stream during a manufacturing process. Production waste (scrap, rework, regrind) that can be returned directly to the same process in which it was generated is not counted as recycled pre-consumer material. "Post-consumer" is defined as material generated by households or commercial, industrial or institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose. This includes materials from the distribution chain.

	<p>Materials that are approved as input in FSC Recycled and which are covered by the term Reclaimed in FSC are regarded as recycled material.</p> <p>NB: In these criteria only the use of recycled material from renewable materials is allowed.</p>
Humid conditions (Service Class 2)	Conditions corresponding to Service Class 2 of EN 1995-1-1 (Eurocode 5) which are characterised by a moisture content in the material corresponding to a temperature of 20°C and a relative humidity in the surrounding air only exceeding 85% for a few weeks per year.
IFL	<p>Intact Forest Landscape</p> <p>Continuous propagation of natural ecosystems within the zone with current forest spread, showing no sign of significant human activity. The area is large enough to maintain all natural biodiversity, including viable populations of widespread species.</p>
Ingoing substances and impurities	<p>Ingoing substances:</p> <p>All substances in the chemical product regardless of amount, including additives (e.g. preservatives and stabilisers) from the raw materials. Substances known to be released from ingoing substances (e.g. formaldehyde, arylamine, in situ-generated preservatives) are also regarded as ingoing substances.</p> <p>Impurities:</p> <p>Residues from production, incl. raw material production, which remain in the chemical product at concentrations below 1000 ppm (0.1000% by weight).</p> <p>Examples of impurities are residues of reagents incl. residues of monomers, catalysts, by-products, scavengers (i.e. chemicals that are used to eliminate/minimise undesirable substances), detergents for production equipment and carry-over from other or previous production lines.</p>
IUCN	International Union for Conservation of Nature IUCN's Red List is the world's most comprehensive overview of the global conservation status of the planet's species, including trees.
Laminate	Laminate means a process in which paper is used in the product, e.g. melamine, HPL or compact laminate.
Nanomaterial	A nanomaterial is a natural, incidental or purposely 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 number or size distribution, one or more external dimensions is in the size range 1–100 nm.
PEFC	<p>Programme for the Endorsement of Forest Certification</p> <p>Certification scheme for forestry and traceability in the supply chain.</p>
VOC	Volatile organic compounds (VOC) are defined as any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101.3 kPa. This definition is the same as in the Paints Directive (2004/42/EC).

1.2 Overview of the requirements

The criteria are mainly divided into requirement areas where some of the requirements apply to all panel types, while others only apply to certain panel types. The table below provides an overview of the requirements that must be met for the different panel types.

Requirement area	Requirement/Material	Requirement	Responsibility for documentation
Description of product and production process	General requirements	O1	Product manufacturer
Product requirements	Quality and properties Information requirements	O2 O3–O4	Product manufacturer
Raw materials			
Wood raw material	Wood, cork and bamboo	O5 O6	Product manufacturer/Subcontractor Product manufacturer
	Recycled wood raw material	O7	Product manufacturer/Subcontractor
Other renewable raw materials	Other renewable raw materials	O8	Product manufacturer/Subcontractor
Paper	Raw material for paper	O9	Product manufacturer
Chemicals			
Chemicals – production and surface treatment	Antibacterial substances	O10	Product manufacturer and manufacturer/supplier of chemical product
	Nanomaterials	O11	Manufacturer/supplier of chemical product
	Preservatives	O12	Manufacturer/supplier of chemical product
Chemicals in production	Classification of chemical products	O13	Manufacturer/supplier of chemical product
	Classification of ingoing substances	O14	Manufacturer/supplier of chemical product
	Prohibited substances	O15	Manufacturer/supplier of chemical product
	VOCs in adhesives	O16	Manufacturer/supplier of chemical product
	Free formaldehyde	O17	Manufacturer/supplier of chemical product
Chemicals – surface treatment	Plastic foiling	O18	Product manufacturer
	Classification of chemical products	O19	Manufacturer/supplier of chemical product
	UV curing surface treatment system	O20	Supplier/performer of surface treatment
	Classification of ingoing substances	O21	Manufacturer/supplier of chemical product
	Prohibited substances	O22	Manufacturer/supplier of chemical product
	Free formaldehyde	O23	Manufacturer/supplier of chemical product
	Application method and quantity applied – surface treatment	O24	Supplier/performer of surface treatment
	Volatile organic compounds (VOC)	O25	Supplier/performer of surface treatment

Emissions			
Emissions from product	Formaldehyde emissions – wood-based products	O26	Product manufacturer
	Emissions from panels	O27	Product manufacturer
Emissions from production – COD	Emissions of COD from wet processes	O28	Product manufacturer
	Emissions of COD from pulp and paper production – HPL and compact laminate	O29	Manufacturer of pulp and paper
Emissions from production – working environment	Emissions to air from production – HPL and compact laminate	O30	Laminate manufacturer
	Emissions of wood dust	O31	Product manufacturer
Climate and energy			
Laminate	Pulp and paper production included in HPL and compact laminate	O32	Manufacturer of pulp and paper
	Laminate	O33	Laminate manufacturer
Wood-based panels	Wood-based panels	O34	Panel manufacturer
Panels from other raw materials	Panels – other renewable panels	O35	Panel manufacturer
CLT and glulam		O36	Product manufacturer and wood suppliers (drying process)
Solid wood panels and mouldings	Solid wood	O37	Product manufacturer and wood suppliers (drying process)
Innovation			
	Innovation requirements	O38	Product manufacturer
Other requirements			
	Maintenance of the Nordic Swan Ecolabel licence	O39–O40	Product manufacturer/licensee

1.3 Product description and product requirements

This chapter sets out product requirements such as quality requirements and consumer information requirements.

O1 Description of the product

Applicants must provide the following information about the product:

- Trade name(s) and brand name(s)
- Description of the product(s) and materials/raw materials (such as wood, paper, straw, etc.) included. The total weight of the product and the weight of the constituent materials/raw materials must be stated. Product sheets or equivalent that describe all materials/raw materials must be included in the application.
- Description of production methods/treatment techniques. Description of subcontractors, including the name of their business, production site, contact and the production steps carried out.
- Names of chemical products used in the production and any surface treatment (including products used by any subcontractors).

For each product: Detailed description of the points above. Product data sheets can be submitted as part of the documentation. Use a flowchart to describe the production process.

O2 Quality and properties

Products covered by a harmonised standard

Products covered by a harmonised standard in accordance with the Construction Products Regulation (EU/305/2011) must document the features and functions with which the product is marketed. As documentation, an example of CE marking and a declaration of performance must be submitted in accordance with the Construction Products Regulation.

Products not covered by harmonised standard

Products not covered by a harmonised product standard can document the features and functions of the product with one of the following options:

- voluntary CE marking and declaration of performance according to an ETA (European Technical Assessment), or
- as an alternative to an ETA, the properties of the product can be declared via a corresponding third-party verification of the product's performance. Third-party verification must be approved by Nordic Ecolabelling.

- For products covered by a harmonised product standard, state which product standard(s) the product is covered by and submit the declaration of performance.
- For products that are not covered by a harmonised standard, a declaration of performance must be submitted in accordance with an ETA or other third-party verification of the product's performance.

O3 Maintenance

For products that are used as the outermost layer on e.g. a wall or ceiling or otherwise have a surface directly facing the consumer, the following must be included:

- Cleaning instructions
- Information on maintenance that includes which care products are suitable for the product (paints, oils, etc.) and how often these products should be used.

The information can either be supplied with the product or consumers can be referred to information on the manufacturer's website.

- Cleaning and maintenance instructions and how these are communicated to the customer.

O4 Information for consumers

Consumer means both private consumers and professional operators.

The following product information should accompany the product and/or be available for download on the manufacturer's website:

- How the product is to be stored before assembly, e.g. at the construction site.
- Instructions for assembly and instructions for any surface treatment after installation.
- If the manufacturer has a system for taking back the product, e.g. old panels or panels that were not used in the construction process, information on this should be provided.
- Information about which materials are used (raw materials and chemicals).
- Specify the standards by which the product is tested.

The information must be available in the language of each country in which the Nordic Swan Ecolabelled product is marketed.

- Product information intended for customers.

1.4 Raw materials

The requirements in this chapter concern extraction of raw materials such as wood, bamboo or other renewable raw materials that are included in panels and glulam products.

- O5 applies to all products containing virgin wood raw material, including wood raw material in paper that is part of a laminate.
- O6 applies to products in which wood raw material is used, e.g. in the form of solid wood, wood chips, shavings or as recycled wood raw material.
- O7 applies to recycled wood raw material.
- O8 applies to other renewable raw materials, such as straw or linen.
- O9 applies to raw materials in paper (kraft paper and decor paper) in laminate

O5 Tree species – restrictions

Nordic Ecolabelling's list of tree species* consists of virgin woods listed on:

- a) CITES (Appendices I, II and III)
- b) IUCN Red List, categorised as CR, EN and VU
- c) Rainforest Foundation Norway's tree list:
- d) Siberian larch (from forests outside the EU)

Use of tree species listed on a) CITES (Appendices I, II and III) is not permitted. Tree species listed on either b), c) or d) may be used if they meet all the following requirements:

- the tree species does not originate from an area/region where it is on the IUCN Red List, categorised as CR, EN or VU
- the tree species does not originate from an Intact Forest Landscape (IFL), as defined in 2002 <http://www.intactforests.org/world.map.html>.
- the tree species shall originate from FSC or PEFC certified forests/plantations and shall be covered by a valid FSC/PEFC Chain of Custody (CoC) certificate documented/controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.
- In addition, tree species grown in plantations shall originate from FSC or PEFC certified plantations established before 1994.

* The list of tree species can be found on the website: <https://www.nordic-ecolabel.org/declare-items/pulp-and-paper/forestry-requirements/forestry-requirements-2020/>

- Enter the names of the tree species included in the product.
- Declaration from the applicant/manufacturer/supplier that tree species listed on a)–d) are not used in the product.

If species from the lists b), c) or d) are used:

- Valid FSC/PEFC Chain of Custody certificate from supplier/applicant/manufacturer covering the specific tree species and

documenting that the wood is controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.

☒ The applicant/manufacturer/supplier shall document full traceability back to the certified forest unit and document the following:

- the wood does not originate from an area/region where it is on the IUCN Red List, categorised as CR, EN or VU.

- the tree species does not originate from an Intact Forest Landscape (IFL), as defined in 2002: <http://www.intactforests.org/world.webmap.html>

- For plantations, the applicant/manufacturer/supplier must document that the tree species does not originate from FSC or PEFC certified plantations established after 1994.

O6 Traceability and certification

The requirement applies to wood raw material, cork and bamboo used in the product. For wood raw material in paper that is part of a laminate, see O9 and O10.

Species name

The applicant/manufacturer must state the name (species name) of the wood raw material/bamboo/cork used in the product.

Chain of Custody certification

All wood raw material and bamboo used in Nordic Swan Ecolabelled products must be covered by a valid Chain of Custody certificate in accordance with FSC/PEFC schemes.

The applicant or product manufacturer must have Chain of Custody certification under the FSC/PEFC schemes.

An applicant/manufacturer who only uses recycled material in the Nordic Swan Ecolabelled product, which is not FSC/PEFC certified, are exempted from the requirement concerning Chain of Custody certification. For a definition of recycled raw material*.

Certified wood raw material, bamboo and cork

A minimum of 70% by weight of the wood raw material, bamboo and cork used in the Nordic Swan Ecolabelled product must come from forests that are managed in accordance with sustainable forestry management principles established by FSC and PEFC and/or be recycled raw material*.

For particleboard and MDF panels, a minimum of 75% of the wood raw material in Nordic Swan Ecolabelled particleboard and MDF panels must consist of recycled raw material*.

The remaining proportion of wood raw material must be covered by FSC/PEFC's control schemes (FSC controlled wood/PEFC controlled sources) or be recycled material.

The applicant/manufacturer must present evidence in the form of a balance sheet from the manufacturer's accounting system showing a correct statement of the allocated input and output of certified raw materials, recycled material and material from "controlled" sources for their production plant and resulting Nordic Swan Ecolabelled products.

**see Terms and definitions.*

- ☒ The names (species names) of the wood raw material, bamboo and cork that are used.
- ☒ The applicant/manufacturer must provide valid FSC/PEFC CoC certification that includes all wood raw material, bamboo and cork used in the Nordic Swan Ecolabelled product.
- ☒ The applicant/manufacturer shall provide audited accounting documents showing that at least 70% of the material in the Nordic Swan Ecolabelled product or production line is from forests or areas that are managed in accordance with sustainable forestry management principles that meet the requirements of the FSC or PEFC scheme. If the product or production line includes uncertified material, evidence must be provided that the content of uncertified material does not exceed 30% and is covered by a verification system that ensures that it is legally harvested and meets any other requirements laid down by FSC or PEFC with regard to uncertified material.
- ☒ An applicant/manufacturer who only uses recycled material in the Nordic Swan Ecolabelled product, which is not FSC/PEFC certified, must provide documentary evidence that the material is recycled, e.g. an invoice.

07 Chemicals – recycled material in wood-based panels

Recycled material in wood-based panels must meet the requirements of the European Panel Federation's (EPF) Standard for delivery conditions of recycled wood, 2002.

This means that the materials must not come from

- Treated wood*
- Wood that exceeds the threshold limit values in the table below:

Substance/compound	Limit value (mg/kg recycled wood)
Arsenic (As)	25
Cadmium (Cd)	50
Chromium (Cr)	25
Copper (Cu)	40
Lead (Pb)	90
Mercury (Hg)	25
Fluorine (F)	100
Chlorine (Cl)	1000
Pentachlorophenol (PCP)	5
Creosote (Benzo(a)pyrene)	0.5

The requirement does not apply to sawdust, wood chips and similar materials that come straight from the wood-processing industry where the wood is virgin/untreated.

** The standard defines treated wood as wood that contains halogenated organic compounds or heavy metals as a result of treatment with wood preservatives.*

- ☒ For wood-based panels: Certification of compliance with the EFP's Standard for delivery conditions of recycled wood, 2002, or subsequent versions, and any equivalent documentation/test report, e.g. in line with the German Waste Wood Ordinance of 2002 or later, showing compliance with the requirements of the standard.

08 Renewable raw materials other than wood raw material

Other renewable raw materials include hemp, linen, bagasse and similar lignocellulose material.

The species name (Latin and English/Nordic language) and geographic origin (country) must be stated for the renewable raw material.

The renewable raw materials must be waste* or residual products* from other production systems, e.g. straw from grain production.

** Waste and residues as defined in EU Directive 2018/2001/EC. Examples of residual products include straw, chaff and the non-edible part of maize.*

- Name and geographic origin of the renewable raw materials.
- Description of the raw material showing that it is a residual or waste product.

09 Raw materials in paper (kraft paper and decor paper) in laminate

The requirement applies to paper wood raw material used in laminate.

If the paper used carries the Nordic Swan Ecolabel and/or the EU Ecolabel, the requirement concerning paper raw material is considered to be fulfilled.

Species name

The applicant/manufacturer of the panel (containing laminate) or paper supplier must state the name (species name) of the fibre raw material used in the paper.

Chain of Custody certification

All wood raw material and bamboo used in Nordic Swan Ecolabelled products must be covered by a valid Chain of Custody certificate in accordance with FSC/PEFC schemes.

The applicant or manufacturer of laminate must have FSC/PEFC CoC certification.

Applicants/manufacturers who only use recycled material*, which is not FSC/PEFC recycled, in the Nordic Swan Ecolabelled product, are exempted from the requirement concerning CoC certification.

**For a definition of recycled raw material, see Terms and definitions.*

Certified fibre raw material

A minimum of 70% by weight of the fibre raw material used in the Nordic Swan Ecolabelled laminate must come from forests that are managed in accordance with sustainable forestry management principles that meet the requirements of the FSC or PEFC Chain of Custody schemes, and/or be recycled raw material.

The remaining proportion shall be covered by FSC/PEFC's control schemes (FSC controlled wood/PEFC controlled sources) or be recycled material*.

The applicant/manufacturer must present evidence in the form of a balance sheet from the manufacturer's accounting system showing a correct statement of the allocated input and output of certified raw materials, recycled material and material from "controlled" sources for their production plant and resulting Nordic Swan Ecolabelled products. Recycled fibre material must be covered by EN 643 delivery notes if FSC/PEFC Recycled claims are not used.

- Name (species name) of the fibre raw material used.
- The applicant/manufacturer must present a valid FSC/PEFC CoC certificate, which includes all fibre raw material used in the Nordic Swan Ecolabelled product.
- Recycled raw material must be covered by EN 643 delivery notes if FSC/PEFC Recycled claims are not used.

- ☒ The applicant/manufacture shall provide audited accounting documents showing that at least 70% of the material in the Nordic Swan Ecolabelled product or production line is from forests or areas that are managed in accordance with sustainable forestry management principles that meet the requirements of the FSC or PEFC scheme. If the product or production line includes uncertified material, evidence must be provided that the content of uncertified material does not exceed 30% and is covered by a verification system that ensures that it is legally harvested and meets any other requirements laid down by FSC or PEFC with regard to uncertified material.
- ☒ Valid licence certificate for the Nordic Swan Ecolabel and/or EU Ecolabel.

1.5 Chemicals

The requirements in this chapter apply to chemical products used in the production of the Nordic Swan Ecolabelled product, such as adhesives, resins and waxes, as well as to surface treatments. The chapter is divided into 3 sub-sections:

- Requirements that apply to all chemicals, both chemicals used in production, including chemicals used in the production of laminate, and surface treatments, section 1.5.1.
- Requirements concerning chemicals in the production of the Nordic Swan Ecolabelled product, such as adhesives, resins and waxes, Section 1.5.2.
- Requirements concerning chemical products used for surface treatment, Section 1.5.3.

Lamination (thin layer of laminate < 2 mm, including melamine) on another panel is not considered to be surface treatment. For a wood-based panel with laminate, both elements must fulfil the requirements for the relevant panel type individually, i.e. the wood-based panel and laminate must both meet the requirements for chemicals in Sections 1.5.1 and 1.5.2.

Chemical products used in the manufacture of paper, and to print patterns on the decor paper, are not covered by the requirements. Auxiliary substances such as lubricants and detergents are also not covered by the requirements.

Definitions

The requirements in the criteria document apply to all ingoing substances in the chemical product. Impurities are not regarded as ingoing substances and are therefore exempt from the requirements. Ingoing substances and impurities are defined as below, unless otherwise stated.

- **Ingoing substances:** All substances in the product, including additives (e.g. preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g. formaldehyde, arylamine, in situ-generated preservatives) are also regarded as ingoing substances.
- **Impurities:** Residues from production, incl. raw material production, which remain in the chemical product at concentrations below 1000 ppm (0.1000% by weight).

Examples of impurities are reagent residue incl. residues of monomers, catalysts, by-products, “scavengers” (i.e. chemicals used to eliminate/minimise undesirable

substances), cleaning agents for production equipment and “carry-over” from other/previous production lines.

1.5.1 Requirements for all chemical products – production and surface treatment

O10 Antibacterial substances

Chemical products and nanomaterials* with antibacterial or disinfectant properties must not be added during production or to the finished product.

The term antibacterial means chemical products that prevent or inhibit growth of microorganisms, such as bacteria or fungi. Silver ions, silver nanoparticles, gold nanoparticles and copper nanoparticles are classed as antibacterial agents.

The requirement does not apply to preservatives used to preserve the chemical product, so-called in-can preservatives.

** In accordance with the definition of a nanomaterial adopted by the European Commission on 18 October 2011 (2011/696/EU), see Definitions.*

- Declaration from the manufacturer of the product that no chemical products and nanomaterials with antibacterial or disinfecting properties have been added during production or to the finished product.
- Declaration from the manufacturer/supplier of the chemical product that the product does not contain nanomaterials with antibacterial or disinfecting properties.

O11 Nanomaterials

The chemical product must not contain nanomaterials* (see Definitions). Exemptions apply for:

- Pigments**
- Naturally occurring inorganic fillers***
- Synthetic amorphous silica****

** In accordance with the definition of a nanomaterial adopted by the European Commission on 18 October 2011 (2011/696/EU), see Definitions.*

*** This exemption does not include pigments added for purposes other than colouring.*

**** This applies to fillers covered by Annex V point 7 in REACH.*

***** This applies to non-modified synthetic amorphous silica.*

- A declaration from the chemical manufacturer that the chemical product does not contain any nanomaterial.

O12 Preservatives

The content of preservatives in the chemical product must meet the following limit values:

Preservative	Limit value
Bronopol	≤ 500 ppm (0.05% by weight)
IPBC (iodopropynyl butylcarbamate)	≤ 2000 ppm (0.20% by weight)
Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one / 2-methyl-4-isothiazolin-3-one)	≤ 15 ppm (0.0015% by weight)
MIT (2-methyl-2H-isothiazol-3-one)	≤ 100 ppm (0.01% by weight)
Total amount of isothiazolinones	≤ 500 ppm (0.05% by weight).

- A declaration from the chemical manufacturer or supplier.
- A safety data sheet for the product in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

1.5.2 Requirements concerning chemicals in production

The requirements in this chapter concern chemicals used in the production of the Nordic Swan Ecolabelled product itself (panels, mouldings, CLT and glulam), such as adhesives, resins or additives.

O13 Classification of chemical products

Chemical products used in the production of the Nordic Swan Ecolabelled product must not be classified in accordance with the table below.

CLP Regulation 1272/2008		
Hazard statement	Hazard class and category	Hazard code
Toxic to the environment	Aquatic Acute 1	H400
	Aquatic Chronic 1	H410
	Aquatic Chronic 2	H411
	Ozone	H420
Acute toxicity	Acute Tox 1 or 2	H300
	Acute Tox 1 or 2	H310
	Acute Tox 1 or 2	H330
	Acute Tox 3	H301
	Acute Tox 3	H311
	Acute Tox 3	H331
Specific target organ toxicity – single exposure/repeated exposure	STOT SE 1	H370
	STOT RE 1	H372
Carcinogenic ¹	Carc. 1A or 1B	H350
	Carc. 2	H351
Germ cell mutagenic ¹	Mut. 1A or 1B	H340
	Mut. 2	H341
Reproductive toxicity ¹	Repr. 1A or 1B	H360
	Repr. 2	H361
	Lact.	H362

¹ Including all combinations of stated exposure route and stated specific effect. For example, H350 also covers the classification H350i.

Note that responsibility for correct classification lies with the manufacturer.

Exemptions apply for:

- Classification H351 for adhesive products containing methylene diphenyl diisocyanate (MDI).
- Classifications H350, H341, H301, H311 and H331 for adhesive products and resins containing formaldehyde (CAS no. 50-00-0). Formaldehyde emissions are regulated in a separate requirement.
- Classifications H341, H301 and H331 for resins containing a maximum of 10% by weight of phenol (CAS no. 108-95-2).
- Classifications H301, H311, H331 and H370 for resins containing a maximum of 10% by weight of methanol (CAS no. 67-56-1).
- Classifications H351 and H361 for resins containing melamine (CAS no. 108-78-1).

- UV curing products are exempted from classification H411 under the following conditions: There must be a controlled closed process where no discharge to recipient takes place. Spillage and general waste (e.g. cleaning residue) must be collected in containers approved for hazardous waste and handled by a waste contractor.
- ☒ A declaration from the chemical manufacturer or supplier.
- ☒ A safety data sheet for the product in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).
- ☒ Exemption for UV curing products: Description of the process and how waste and general waste are handled, including information about who receives the general waste.

O14 Classification of ingoing substances

Ingoing substances in the chemical product used in production must not have the classifications in the table below.

CLP Regulation 1272/2008		
Hazard statement	Hazard class and category	Hazard code
Carcinogenic ¹	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic ¹	Mut. 1A or 1B Mut. 2	H340 H341
Reproductive toxicity ¹	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

¹ Including all combinations of stated exposure route and stated specific effect. For example, H350 also covers the classification H350i.

Exemptions apply for:

- Adhesive containing methylene diphenyl diisocyanate (MDI) classified as H351.
- Adhesive and resin containing formaldehyde (CAS no. 50-00-0) classified as H350 and H341. Formaldehyde emissions are regulated in a separate requirement.
- Resin containing maximum 10% by weight of phenol (CAS no. 108-95-2) classified as H341.
- Resin containing melamine (CAS no. 108-78-1) classified as H351 and H361.
- Titanium dioxide (CAS no. 13463-67-7) classified as H351.
- 1,1,1-Trimethylolpropane (TMP, CAS no. 77-99-6) classified as H361 is exempted with time limits up to and including 31.12.2024.
- ☒ A declaration from the chemical manufacturer or supplier.
- ☒ A safety data sheet for the product in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

O15 Prohibited substances

The chemical product used in production must not contain the following substances:

- 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)**
- Halogenated organic compounds. Exemptions apply for Bronopol, IPBC and CMIT/MIT (3:1). These are set out in a separate requirement.
- Butylhydroxytoluene (BHT, CAS No. 128-37-0)
- Aziridine and polyaziridines
- Bisphenols
- APEO (alkylphenol ethoxylates) and APD (alkylphenol derivatives/alkylphenols) ***
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Endocrine disruptors: Substances on the EU member state initiative “Endocrine Disruptor Lists”, List I, List II and List III, see following links:

List I: <https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu>

List II: <https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption>

List III: <https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities>

Substances that are transferred to one of the corresponding sub-lists “Substances no longer on list” and that no longer feature on Lists I–III are not prohibited. However, this does not apply to the substances listed in Sub-List II that were evaluated on the basis of regulations or directives that do not have provisions for identifying endocrine disruptors (e.g. the Cosmetics Regulation). These substances may have endocrine disrupting properties. Nordic Ecolabelling will assess these substances on a case-by-case basis, based on the background information provided in Sub-List II.

** 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*

**** Alkylphenol derivatives are defined as substances that release alkylphenols when they break down.*

- A declaration from the manufacturer/supplier of the chemical product.
- A safety data sheet for the product in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

O16 Volatile organic compounds in adhesives

Volatile organic compounds (VOC), including volatile aromatic compounds (VAH), may be present in the adhesive to a maximum of 3% by weight.

VAHs may be present in the adhesive to a maximum of 0.1% by weight.

Resin used in the production of laminate is exempted from the requirement that the laminate must meet later requirements for VOC emissions.

Volatile organic compounds (VOC) are defined as any organic compound having an initial boiling point less than or equal to 250°C measured at a standard

pressure of 101.3 kPa. This definition is the same as in the Paints Directive (2004/42/EC).

- Declaration from the adhesive manufacturer/supplier that the requirement is fulfilled.

O17 Free formaldehyde

The content of free formaldehyde (from formaldehyde not deliberately added or from formaldehyde-releasing substances) must not exceed 0.02% by weight (200 ppm) in the chemical product.

For adhesive products, up to 0.2% by weight (2000 ppm) of free formaldehyde is permitted. The requirement applies to the pure adhesive before mixing with any hardener.

Resin used in the production of laminate is exempted from the requirement if the laminate fulfils later requirements concerning emissions of formaldehyde.

- A declaration from the manufacturer/supplier of the chemical product that the requirement is fulfilled.

The content of free formaldehyde in chemical products used in the production of the panel/moulding must be up to 0.2% by weight (2000 ppm) with the exception of adhesive products mixed with hardener. For adhesive products mixed with a hardener, up to 0.2% by weight (2000 ppm) of free formaldehyde is permitted in the final mixture.

1.5.3 Surface treatment

The requirements in this chapter apply to surface treatment products such as lacquers, oils, paints and stains. Any filler used is also covered by the requirements. It should be noted that chemicals used for surface treatment must also meet the requirements in Section 3.5.1.

There are also requirements for foiling with plastic.

Lamination (thin layer of laminate < 2 mm, including melamine) on another panel is not considered to be surface treatment. For a wood-based panel with laminate, both elements must fulfil the requirements for the relevant panel type individually, i.e. the wood-based panel and laminate must both meet the requirements for chemicals in Sections 3.5.1 and 3.5.2.

O18 Plastic foiling

The type of plastic used for wrapping the surface must be stated.

Foiling with chlorinated plastics such as PVC is not permitted.

Adhesives used for foiling must fulfil the requirements in Sections 3.5.1 and 3.5.2.

- State plastic type for foiling.

O19 Classification of chemical products

The chemical products used for surface treatment must not have any of the classifications in the table below.

CLP Regulation 1272/2008		
Hazard statement	Hazard class and category	Hazard code
Toxic to the environment*	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity – single exposure/repeated exposure	STOT SE 1 STOT RE 1	H370 H372
Respiratory sensitisation	Resp. Sens. 1, 1A or 1B	H334
Carcinogenic ¹	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic ¹	Mut. 1A or 1B Mut. 2	H340 H341
Reproductive toxicity ¹	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

¹ Including all combinations of stated exposure route and stated specific effect. For example, H350 also covers the classification H350i.

* Exceptions are made for UV curing surface treatment products classified as environmentally hazardous if requirement O20 is fulfilled.

Note that responsibility for correct classification lies with the manufacturer.

- Safety data sheet for each chemical product used in the surface treatment (system) in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).
- Declaration from the manufacturer of the chemical products used in the surface treatment (system).

O20 UV curing surface treatment system

UV curing surface treatment products must be applied to the material in a controlled closed process where no discharge to recipient takes place. Spillage and general waste (e.g. cleaning residue) must be collected in containers approved for hazardous waste and handled by a waste contractor.

- Description of the process and how waste and residual waste are handled, including information on who receives the residual waste from the performer of the surface treatment.

O21 Classification of ingoing substances

Ingoing substances in the chemical product that is used for the surface treatment must not have the classifications in the table below:

CLP Regulation 1272/2008		
Hazard statement	Hazard class and category	Hazard code
Carcinogenic ¹	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic ¹	Mut. 1A or 1B Mut. 2	H340 H341

Toxic for reproduction ¹	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
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¹ Including all combinations of stated exposure route and stated specific effect. For example, H350 also covers the classification H350i.

Exemptions apply for:

- Photo initiators classified as H351, H341 or H361
- Titanium dioxide (CAS no. 13463-67-7) classified as H351
- 1,1,1-Trimethylolpropane (TMP, CAS no. 77-99-6) classified as H361 is exempted with time limits up to and including 31.12.2024.
- Mequinol (CAS no. 150-76-5) classified as H361
- The hardener in two-component UV products can be exempted from the requirement if the following is met: it must be documented that the workers are not exposed to the components, e.g. by using safety equipment when mixing or that the mixing takes place automatically without exposure of the workers and that the application of the finished two-component system is done in a closed system.
- Safety data sheet for each chemical product used in the surface treatment (system) in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).
- A declaration from the manufacturer of the chemical product(s) used in the surface treatment.
- Exemption for two-component products: description of the application system and how workers are protected from exposure.

O22 Prohibited substances

The chemical product must not contain the following substances:

- 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)**
- Halogenated organic compounds with the following exceptions:
 - The preservatives bronopol, IPBC and CMIT/MIT (3:1). These are addressed in a separate requirement, see O14.
 - Halogenated organic pigments that comply with the Council of Europe recommendation “Resolution AP (89) 1 on the use of colourants in plastic materials coming into contact with food”, point 2.5
 - Epoxy acrylate used in UV curing surface treatment products
- Aziridine and polyaziridines
 - An exemption is made for aziridines/polyaziridines if the substance is not classified as carcinogenic, mutagenic or reprotoxic from any manufacturer or in ECHA.
- Bisphenols.
 - Bisphenol A used in the production of epoxy acrylate is not covered by the requirement.
- APEO (alkylphenol ethoxylates) and APD (alkylphenol derivatives)/alkylphenols ***
- Phthalates

- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight
- Endocrine disruptors: Substances on the EU member state initiative “Endocrine Disruptor Lists”, List I, List II and List III. See links below.
 - An exemption is made for BHT that is included in UV curing lacquers and paints. If BHT receives a harmonised classification that means the substance does not meet the requirements in the criteria document, the exemption will lapse.

List I: <https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu>

List II: <https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption>

List III: <https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities>

Substances that are transferred to one of the corresponding sub-lists “Substances no longer on list” and that no longer feature on Lists I–III are not prohibited. However, this does not apply to the substances listed in Sub-List II that were evaluated on the basis of regulations or directives that do not have provisions for identifying endocrine disruptors (e.g. the Cosmetics Regulation). These substances may have endocrine disrupting properties. Nordic Ecolabelling will assess these substances on a case-by-case basis, based on the background information provided in Sub-List II.

** 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*

**** Alkylphenol derivatives are defined as substances that release alkylphenols when they break down.*

- Safety data sheet for each chemical product used in surface treatment in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).
- Declaration from the manufacturer of the chemical product(s) used in the surface treatment.

O23 Free formaldehyde

The content of free formaldehyde in each individual chemical product used for surface treatment must not exceed 0.2% by weight (2000 ppm).

- Declaration from the manufacture of the chemical product(s) in the surface treatment system.

O24 Application method and quantity applied – surface treatment

The following information must be given for each surface treatment system used:

- a) Name of surface treatment product and manufacturer of surface treatment product
- b) Quantity applied (g/m²), number of coats and application method(s) used

- c) The following efficiency rates must be used when calculating VOC quantities in subsequent requirements:
- Automated spray with no recycling: 50%
 - Automated spray with recycling: 70%
 - Spray application, electrostatic: 65%
 - Spray application, bell/disk: 80%
 - Roller coating: 95%
 - Curtain coating: 95%
 - Vacuum coating: 95%
 - Dipping: 95%
 - Rinsing: 95%

The efficiency rates are standard values. Other efficiency rates may be used if they can be documented.

- Description from the performer of the surface treatment of each surface treatment system used, in line with the requirement.

O25 Amount of volatile organic compounds (VOC) applied

The chemical products that are used must meet one of the following alternatives in each surface treatment system:

- a) The total VOC content must not exceed 5% by weight
- b) The total amount of VOCs applied must not exceed 10 g/m² treated surface.

The applied amount of VOCs in option b) is calculated using the following formula:

$$\frac{\text{Applisert mengde av overflatebehandlingsprodukt} \left(\frac{\text{g}}{\text{m}^2} \right) \times \text{Andel VOC i overflatebehandlingsproduktet} (\%)}{\text{Overflatebehandlingsens virkningsgrad}(\%)}$$

For both these alternatives, it is the VOC content of the chemical products in their uncured form that must meet the requirement. If the products require dilution, the calculation must be based on the content in the diluted product.

- Safety data sheet for each chemical product used in the surface treatment system in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).
- Declaration from the manufacturer/supplier of the chemical products in the surface treatment system, detailing the amount of VOCs in each product.
- A calculation from the performer of the surface treatment showing that alternative b) in the requirement is met if the surface treatment system does not meet alternative a).

1.6 Emissions

The requirements in this chapter apply to different types of emissions. Emissions from the product (1.6.1), from the production process (COD 1.6.2) and in the working environment (1.6.3) are subject to requirements. The requirements differ depending on the type of product.

1.6.1 Emissions from product

- Wood-based products containing formaldehyde-based adhesives must fulfil O26.
- Sheet material coated with laminate (including melamine) and panels based on renewable raw materials other than wood must fulfil O27.

O26 Formaldehyde emissions – wood-based products

The requirement does not include HPL, compact laminate, sheet material coated with laminate (including melamine), and panels based on renewable raw materials other than wood.

The requirement applies to the raw wood-based product.

Wood-based products containing formaldehyde-based adhesives must comply with one of the following limit values:

- Emissions of formaldehyde shall on average not exceed 0.062 mg/m³ air according to test method EN 717-1 or
- Emissions of formaldehyde shall on average not exceed 0.124 mg/m³ air according to test method EN 16516.

** It is unclear whether construction panels are covered by the EU taxonomy. Nordic Ecolabelling is following the development.*

- ☒ Analysis report, including measurement methods, results and measurement frequency. It must be clearly stated which method/standard was used, the laboratory that conducted the analysis, and that the analysis laboratory is an independent third party. Other analysis methods than those stated in the requirement may be used, provided that the correlation between the test methods can be verified by an independent third party.

O27 Emissions from panels

Emissions from panels coated with laminate (including melamine), HPL, compact laminate, surface-treated panels/mouldings and panels based on renewable raw materials other than wood, such as straw or linen, must meet the limit values in the table below.

The test shall be carried out in accordance with the test method EN 16516.

Substance or group of substances	Limit value after 28 days* (µg/m ³) according to EN 16516.
TVOC (C6-C16)	160
SVOC (C16-C23)	30
Formaldehyde	20

** If the limit values in the table are met for a period shorter than 28 days, this is accepted.*

- ☒ Analysis report, including measurement methods, results and measurement frequency. It must be clearly stated which method/standard was used, the laboratory that conducted the analysis, and that the analysis laboratory is an independent third party. Other analysis methods than those stated in the requirement may be used, provided that the correlation between the test methods can be verified by an independent third party.

1.6.2 Emissions from production – COD

O28 Emissions of COD from wet processes

The requirement covers wet processes in panel production. COD (Chemical Oxygen Demand) emissions to water must be maximum 20 g COD/kg product (unfiltered sample).

A description of the preparation and analysis methods is given in Appendix 1.

- Measurement results including information on sampling programmes and measurement methods for the past 12 months and measurement frequency.

O29 COD emissions from the production of paper and pulp used in HPL and compact laminate

The requirement applies to paper and pulp that is included in HPL and compact laminate.

COD (Chemical Oxygen Demand) emissions to water must be less than the stated COD value in the table below. A description of the preparation and analysis methods is provided in Appendix 1.

The COD is calculated by adding up COD emissions from pulp and paper:

COD mass (kg/ADt) + COD emissions paper machine (kg/ADt).

For paper produced from mixtures of chemical, recycled fibre and mechanical pulps, a weighted limit value is calculated from the proportion of the various pulp types. In the weighted calculation, the percentage of COD emissions from the paper machine must be set to 1 kg/ADT. For example, for 60% unbleached chemical mass and 40% recycled pulp, the calculation is: $(14-1 \times 0.6) + (4-1 \times 0.4) = 7.8 + 1.2 = 9.0$ kg/ADT

Pulp types	Total COD emissions for both pulp and paper (kg/ADt)
Unbleached chemical pulp	14.0
CTMP pulp	19.0
TMP/groundwood pulp	7.0
Recycled fibre pulp	4.0

- Information about the types of pulp used in the production of paper.
- If pulp that has been checked in accordance with Nordic Ecolabelling's Basic Module for paper is used: Description of the producer, production site and name of the pulp.
- Description of the sampling procedure including measurement methods and measurement results in the last 12 months from the producers of the paper and pulp.
- Calculation from the producers of the paper and pulp showing that the total emissions of COD are below the relevant limit value in the requirement.

1.6.3 Emissions from production – working environment

O30 Emissions to air from production of laminate in HPL and compact laminate

Laminate produced with resins containing formaldehyde and phenol must adhere to the following hygienic limit values for emissions to air in the workplace*:

- The average value during an 8-hour period must not exceed:
 - 0.3 ppm (0.37 mg/m³) for formaldehyde
 - 2 ppm (8 mg/m³) for phenol.
- The average value during a reference period of 15 minutes must not exceed
 - 0.6 ppm (0.74 mg/m³) for formaldehyde
 - 4 ppm (16 mg/m³) for phenol.

** If the legislation in the country in question has lower limit values than those stated in the requirement, the legal limit values must be fulfilled.*

- Test report showing compliance with the requirement. The report shall contain information about measurements, sampling programmes, measurement methods and measurement frequency. For analysis methods, see Appendix 1.
- Alternative documentation showing the legal requirements of the country in which production takes place. If the legislation in the individual country has lower limit values than those stated in the requirement, no further documentation is necessary.

O31 Emissions of wood dust

When producing products containing wood-based raw materials, emissions of inhalable wood dust to air in the workplace must not exceed 2 mg/m³.

If the legislation in the individual country has a lower limit value than stated in the requirement, the legal limit value must be complied with.

- Test report showing compliance with the limit value. The report shall contain information about measurements, sampling programmes, measurement methods and measurement frequency. For analysis methods, see Appendix 1.
- Alternative documentation showing the legal requirement in the country where production takes place. If the legislation in the individual country has lower limit values than those stated in the requirement, no further documentation is necessary.

1.7 Climate and energy

The requirements in this chapter concern energy consumption and energy sources. Different requirement limits are set based on the type of product, such as wood-based panel, laminate or glulam, and the parts of the production that are covered will also vary. For example, energy consumption in the actual production is subject to requirements for construction panels, while for solid wood panels and mouldings, the focus is on the drying process and finishing.

The calculations must also include energy consumption for adhesive production. If no detailed information is available from the relevant adhesive manufacturers, a standard value of 15 MJ/kg of adhesive may be used. Energy consumption in the production of any surface treatment should not be included. For certain product types, the calculation must cover total energy consumption for drying

and the actual production of the product, e.g. glulam. If it proves difficult to obtain data on energy consumption from all subcontractors in drying and processing, a standard value of 1500 MJ/m³ can be used. When converting to MJ/kg, the density of the specific product should be used in the first instance, but a value of 500 kg/m³ can be used if this is not available. Further descriptions of how the energy calculation should be carried out can be found in Appendices 2 and 3.

1.7.1 Laminate

For laminate, requirements are set for energy consumption in the production of kraft paper and paper pulp that is included in HPL and compact laminate, as well as energy consumption in the production of the laminate itself. A detailed description of how the calculation is to be made is given in Appendix 2 (pulp and paper) and Appendix 3 (panel production).

O32 Energy consumption in the production of kraft paper and pulp that is included in HPL and compact laminate

The requirement covers pulp and paper used in the production of kraft paper.

The requirement does not cover the production of decor paper.

The following requirements must be met:

$$P_{\text{electricity}(\text{total})} < 2.5$$

$$P_{\text{fuel}(\text{total})} < 2.5$$

For paper consisting solely of TPM/GW* produced on-site, the limit value for $P_{\text{fuel}(\text{total})}$ is 1.25

P is the energy score for the paper and pulp production. The energy scores from the production of both the paper and the pulps are included in $P_{\text{electricity}(\text{total})}$ and $P_{\text{fuel}(\text{total})}$. A more detailed description of how the calculation should be carried out can be found in Appendix 2.

TPM/GW = Thermomechanical pulp/groundwood

- If pulp that has been checked in accordance with Nordic Ecolabelling's Basic Module for paper is used: Description of the producer, production site and name of the pulp.
- Calculation from the producers of the paper and pulp showing that the point limit is fulfilled. A calculation sheet has been developed for the energy calculation, which can be obtained from Nordic Ecolabelling.

O33 Energy consumption – laminate production

Energy consumption in the production of laminate must not exceed the following limit values:

Panel type	Energy consumption MJ/kg panel
Compact laminate HPL ≥ 2 mm included	14 MJ/kg
Other types of laminate ≤ 2 mm HPL ≤ 2 mm included	8 MJ/kg

A detailed description of how to perform the calculation is given in Appendix 3.

- Calculation showing compliance with the requirement. The calculation must contain information about the quantity of panels produced, electricity and fuel consumed, and which fuel sources have been used.

1.7.2 Wood-based panels

O34 Energy consumption – wood-based panels

Energy consumption in the production of the panel must not exceed the limit values given in the table below:

Panel type	Energy consumption MJ/kg panel
Particleboard	6 MJ/kg
MDF and HDF	7 MJ/kg
Wood-based panels – wet process	13 MJ/kg
OSB	4 MJ/kg
Plywood	9 MJ/kg
LVL	9 MJ/kg
SWP	5 MJ/kg

If a wood-based panel type is laminated, the wood-based panel must fulfil the requirement limit here, while the laminate must fulfil the requirements for laminate in O33. Melamine-coated wood panels must fulfil the requirement limit here.

Mouldings in equivalent materials as shown in the table are also covered by the requirement limits.

A detailed description of how to perform the energy calculation is given in Appendix 3.

- Calculation showing compliance with the requirement. The calculation must contain information about the quantity of panels produced, electricity and fuel consumed, and which fuel sources have been used.

1.7.3 Panels in other raw materials

O35 Energy consumption – panels in other renewable raw materials

Energy consumption in the production of panels based on other renewable raw materials, such as straw or linen, must not exceed 1 MJ/kg.

A detailed description of how to perform the calculation is given in Appendix 3.

- Calculation showing compliance with the requirement. The calculation must contain information about the quantity of panels produced, electricity and fuel consumed, and which fuel sources have been used.

1.7.4 CLT and glulam

The requirements in this section concern cross laminated timber (CLT) as defined in EN-16351 Timber structures – Cross laminated timber, and glued laminated timber (glulam) as defined in EN-14080 Timber structures – Glued laminated timber. EN-14080 covers the following products: Glued laminated timber (glulam), glued solid timber, glulam with large finger joints and block glued glulam.

O36 CLT and glulam (cross and glued laminated timber)

Products covered by this requirement are CLT as defined in EN-16351 and various types of glulam covered by EN-14080.

The energy consumption in production must not exceed 5 MJ/kg.

A detailed description of how to perform the calculation is given in Appendix 3.

- Calculation showing compliance with the requirement. The calculation must include information about suppliers, the quantity from each supplier and the consumption of electricity and fuel, as well as the fuel sources used.

1.7.5 Solid wood panels and mouldings

O37 Solid wood panels and mouldings

The energy consumption for drying, sawing and planing wood that is included in solid wood panels and mouldings must not exceed 1350 MJ/m³.

The limit value can be met per supplier or as an overall average of the suppliers.

- Calculation showing compliance with the requirement. The calculation must include information about suppliers, the quantity from each supplier and the consumption of electricity and fuel, as well as the fuel sources used.

1.8 Innovation

The requirement in this chapter covers various areas where Nordic Ecolabelling sees an opportunity to promote manufacturers that contribute to innovation, e.g. by using bio-based raw materials for adhesive production; to the circular economy or reduced greenhouse gas emissions; and to measures concerning biodiversity. One of the points must be fulfilled, and the manufacturer can decide which measure they wish to fulfil. This offers flexibility. Nordic Ecolabelling would also like to provide signals as to what may become mandatory in the next revision of the criteria.

O38 Innovation in production

The applicant/producer must fulfil at least one of the following options:

Area	Requirement
Chemicals	Adhesives and/or surface treatment products, such as paints, lacquers or stains, used in the production of the Nordic Swan Ecolabelled product are Nordic Swan Ecolabelled.
	No adhesives based on urea-formaldehyde or isocyanate are used in the production of the Nordic Swan Ecolabelled product.
	The binder in the adhesive used in the production of the Nordic Swan Ecolabelled product contains one or more components that are made of renewable raw materials.
Raw materials	A minimum 100% by weight of the wood raw material, bamboo and cork used in the Nordic Swan Ecolabelled product (production line) comes from forests that are managed in accordance with sustainable forestry management principles/recycled wood raw material as defined by FSC or PEFC, and is covered by a valid Chain of Custody certificate in accordance with the FSC/PEFC schemes.
	A minimum 50% by weight of the wood raw material, bamboo and cork used in the Nordic Swan Ecolabelled product (production line) is post-consumer* recycled wood/paper raw material.
Climate	The production (production line) of the Nordic Swan Ecolabelled panel, moulding and glulam is fossil-free*. * Fossil-free means that the energy used for the production of heat, steam or pressure on the production line is not based on fossil energy sources such as oil, diesel and natural gas. Electricity is not covered by the requirement.
	Energy consumption in the production of the Nordic Swan Ecolabelled panel is at least 10% lower than the limit values specified in requirements O33–O37.
	The manufacturer has its own energy production, e.g. solar panels, solar collectors or its own wind turbine, which is used for the manufacturing of the Nordic Swan Ecolabelled panels, mouldings or glulam. This does not apply to heat pumps.

- Documentation in relation to the above-mentioned alternatives in the requirement.

2 Licence maintenance

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

O39 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.

- Upload your company's routine for handling and archiving customer complaints.

O40 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.

You can upload your company's routine or a description of the actions to ensure traceability in your company.

- Please upload your routine or a description.

3 Changes compared to previous version

In this revision, a major change has been made to the product group definition, with the product group now divided up so that the requirements for products made from renewable materials have their own document. There will therefore be some adjustments to the requirement numbers and structure. Below is a short list of the key changes compared with the previous version of the criteria. It is a good idea to use a table like this:

Comparison of requirements for 010 construction and façade panels criteria version 6 and criteria version 7.

Proposed requirement generation 7	Requirement generation 6	Same req.	Changed	New req.	Comment
O1 Description of the product	O1	x			The requirement is more or less the same as in the previous generation.
O2 Quality and properties	O34	x			The requirement is similar to the previous generation, but one of the options for documenting the requirement has been removed.
O3 Maintenance	O35	x			The previous requirement has been divided into two (O3 and O4).
O4 Information for users	O35		x		The previous requirement has been divided into two and some new points have been introduced, including information about the manufacturer's take-back arrangement.

Proposed requirement generation 7	Requirement generation 6	Same req.	Changed	New req.	Comment
O5 Tree species – restrictions	O5		x	x	The requirement has been updated with Nordic Ecolabelling's requirements concerning tree species that are prohibited or restricted. The requirement concerning raw material used in paper production is new.
O6 Traceability and certification	O6		x		The manufacturer of the product is required to be CoC certified.
O7 Chemicals – recycled wood raw material				x	New requirement for testing of chemicals in recycled wood raw material.
O8 Paper raw material	O5		x		The requirement has been tightened in that the laminate manufacturer must be CoC certified and the limit for certified raw material is now 70%.
O9 Other renewable raw materials				x	Requirement introduced for other renewable raw materials.
O10 Antibacterial substances	O22	x			
O11 Nanomaterials	O23	x			
O12 Preservatives	O22		x		Requirement limit for MIT has been tightened
O13 Classification of chemical products	O19		x		Prohibition of chemicals classified as environmentally hazardous has been added.
O14 Classification of ingoing substances	O20		x		Prohibition against CMR category 2 added.
O15 Prohibited substances	O21		x		The requirement has been updated, e.g. referring the requirement for endocrine disruptors to other lists, and the substances that are prohibited have also been expanded, e.g. there is a ban on all bisphenols.
O16 Volatile organic compounds in adhesives	O26	x			
O17 Free formaldehyde	O28		x		The requirement limit for formaldehyde content has been tightened.
O18 Plastic foiling				x	
O19 Classification of chemical products (surface treatment)	O19		x		A ban on chemicals classified as environmentally hazardous has been added (with an exemption for UV curing products). Prohibition of H334 (allergenic) has been added.

Proposed requirement generation 7	Requirement generation 6	Same req.	Changed	New req.	Comment
O20 UV curing surface treatment system				x	
O21 Classification of ingoing substances (surface treatment)	O20		x		Prohibition against CMR category 2 has been added.
O22 Prohibited substances (surface treatment)	O21		x		See O16. Some other exemptions are granted.
O23 Free formaldehyde (surface treatment)	O28	x			
O24 Application method and amount – surface treatment				x	
O25 Amount of volatile organic compounds (VOC) applied	O27		x		The requirement limit has not been changed, but the calculation now takes the application method into account.
O26 Formaldehyde emissions – wood-based products	O32		x		The requirement applies generally for wood-based products that contain formaldehyde-based adhesives. The requirement limits have been tightened.
O27 Emissions panels	O33		x		The requirement limit for formaldehyde has been tightened.
O28 Emissions of COD from wet processes	O29	x			
O29 Emissions of COD from the production of pulp and paper – HPL and compact laminate	O9	x			The requirement remains unchanged, but with clarification on how the calculation should be made when several pulps are included.
O30 Emissions to air from laminate production – HPL and compact laminate (working environment)	O31	x			
O31 Emissions of wood dust	O3	x			
O32 Laminate – pulp and paper production – HPL and compact laminate (energy)	O12		x		The requirement has been updated in accordance with Nordic Ecolabelling's Basic Module for pulp and paper, generation 3. The nominal limit has been removed, and only relates to kraft paper.
O33 Laminate (energy)	O13		x		Requirement limits have been tightened.
O34 Wood-based panels (energy)	O14		x		The requirement limits have been tightened and divided up per panel type, such as MDF, particleboard and OSB.
O35 Panels – other renewable raw materials (energy)				x	New req.
O36 CLT and glulam (energy)					New req.

Proposed requirement generation 7	Requirement generation 6	Same req.	Changed	New req.	Comment
O37 Solid wood panels and mouldings (energy)				x	New req.
O38 Innovation				x	New req.
O39–O40			x		The requirements have been updated in accordance with Nordic Ecolabelling's current standard formulation.

Regulations for the Nordic Ecolabelling of products

When the Nordic Swan Ecolabel is used on products the licence number shall be included.

More information on graphical guidelines, regulations and fees can be found at www.nordic-ecolabel.org/regulations/

Follow-up inspections

Nordic Ecolabelling may decide to check whether the product fulfils Nordic Ecolabelling requirements during the licence period. This may involve a site visit, random sampling or a similar test.

The licence may be revoked if it is evident that the product does not meet the requirements.

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

Criteria version history

Nordic Ecolabelling adopted version 7.0 of the criteria for XX on DAY MONTH YEAR. The criteria are valid until DAY MONTH YEAR.

Appendix 1 Laboratories and methods for testing and analysis

General requirements for test and analysis laboratories

Tests must be carried out in a correct and competent way. The analysis laboratory/test institute must be impartial and professional.

If accreditation is not separately required, the test and/or analysis laboratory must comply with the general requirements of the EN ISO 17025 standard for the quality control of test and calibration laboratories or have official GLP status.

The applicant's own testing laboratory may be approved for analysis and testing if:

- the authorities monitor the sampling and analysis process, or if
- the manufacturer has a quality management system encompassing sampling and analysis and has been certified to ISO 9001 or ISO 9002, or if
- the manufacturer can demonstrate agreement between a first-time test conducted at the manufacturer's own laboratory and testing carried out in parallel at an independent test institute, and that the manufacturer takes samples according to a set sampling plan.

Test method for COD emissions

COD content shall be tested in accordance with ISO 6060 (Water quality — Determination of the chemical oxygen demand) or equivalent. If another analysis method is used, the licensee must show that it is equivalent. An analysis of PCOD or BOD may also be used as verification if a correlation with COD can be demonstrated. The method for measuring TOC is ISO 8245 Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC).

Sample frequency: Emissions to water are calculated as the annual average value and are based on at least one representative daily sample per week. Alternatively, a sampling frequency set by the authorities may also be approved.

Sampling: Water samples must be taken after the process wastewater has been treated in any internal water treatment plant. The flow at the time of sampling must be indicated. If the process wastewater is externally purified with other wastewater, the analysis result should be reduced by the documented efficiency of the COD in the external water treatment plant. The analyses must be carried out on unfiltered and unsedimented samples in accordance with standard ISO 6060.

Working environment – emissions to air

Air measurements must be carried out in accordance with standardised test methods in this area, such as EN 689 Workplace exposure – Measurement of exposure by inhalation to chemical agents – Strategy for testing compliance with occupational exposure limit values; EN 482 Workplace exposure – Procedures for

the determination of the concentration of chemical agents – Basic performance requirements; or equivalent method approved by Nordic Ecolabelling.

EN 14042 Workplace atmospheres – Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.

Appendix 2 Energy requirements for paper and pulp production

Energy calculation guidelines

Use of energy in the form of fuel and electricity is subject to requirements. Through information on the actual energy consumption during production in relation to set reference values, an energy point is calculated.

The energy calculation covers the entire paper product; both the paper production and the pulps used. Fillers in paper and transport of raw materials as well as within the factory area shall not be included in the energy calculation.

Non-integrated pulp mill

Electricity

The calculations must include both purchased and on-site produced electricity.

Electricity = on-site produced electricity + purchased electricity - sold electricity.

The calculation of electricity consumption must be based on invoices and readings from electricity meters. On-site produced electricity is documented using readings from electricity meters. The requirement covers all processes from debarking to drying the pulp. An exemption applies to electricity for offices or lighting in the factory area. The average electricity consumption can be used for all pulps if the pulp mill only produces pulps of equivalent quality using the same type of process.

Fuel

The calculation must include both purchased fuel and fuel produced at the plant, divided into renewable and fossil fuels. The pulp producer must report the fuel used for on-site generated electricity and should deduct the fuel for electricity before reporting it to the paper manufacturer. The paper manufacturer deducts the fuel consumption from internally produced electricity using a factor of 1.25 in its own energy calculation.

Fuel pulp = fuel produced at the plant + purchased fuel - sold fuel * (sold fuel and/or heat/0,8)

The amount of fuel purchased must be adjusted to the quantities at the start and end of the current year. Consumption of internally produced fuel from bark, shavings and other wood residues is calculated using the thermal values for the fuels used or measured.

**Excess energy*

Excess energy sold in the form of electricity, steam or heat is subtracted from the total consumption. The amount of fuel used to produce electricity or heat is calculated by dividing the sold electricity or heat by 0.8. This is equivalent to an average efficiency for the total production of electricity and heat.

Alternatively, the actual efficiency of the plant in the conversion of fuel to heat energy can be used.

Verification

An overview of the factory's energy supply system showing the number of boilers, with information about the boiler effect and which fuel is used.

Report on the amount of purchased, on-site produced and sold electricity.

Report on the amount of purchased, on-site produced and sold fuel/heat

Conversion factors and efficiency must be stated if thermal energy has been re-calculated to fuel.

The calculation sheet produced by Nordic Ecolabelling can be used.

Non-integrated paper mill

Electricity

The calculations must include both purchased and on-site produced electricity.

Electricity = on-site produced electricity + purchased electricity - sold electricity.

The calculation of electricity consumption must be based on invoices and readings from electricity meters. On-site produced electricity is documented using readings from electricity meters. The requirement covers all processes from pulping to drying the base paper. An exemption applies to electricity for offices or lighting in the factory area. The average electricity consumption can be used for all paper if the paper mill only produces paper of equivalent quality using the same type of process.

Fuel

All purchased fuel must be included in the calculations, divided into fossil and renewable fuels.

Fuel paper = purchased fuel - sold heat converted to excess energy*

The amount of purchased fuel must be adjusted to the quantities at the start and end of the current year.

**Excess energy*

Excess energy sold in the form of electricity, steam or heat is subtracted from the total consumption. The amount of fuel used to generate electricity or heat that is sold off is calculated by dividing the sold electricity or heat by 0.8. The coefficient of 0.8 is equivalent to the average energy efficiency for total heat and electricity production. Alternatively, the actual energy efficiency of the plant in the conversion of fuel to heat energy can be used.

Verification

An overview of the paper machinery's energy supply system showing the number of boilers, with information about the boiler effect and which fuel is used.

Report on the amount of purchased, on-site produced and sold electricity.

Report on the amount of purchased, on-site produced and sold fuel/heat

Conversion factors and efficiency must be stated if thermal energy has been re-calculated to fuel.

The calculation sheet produced by Nordic Ecolabelling can be used.

Steam

If excess steam from another production process is used (e.g. from another industry), the energy content of the steam must be included in the calculation. In this case, Table 1, the steam table should be used. If steam from electric boilers is used, the energy content must be converted to fuel in the same way, but the energy content must be multiplied by 1.25.

Energy calculation, paper production

Energy score for paper production

Energy scores for $P_{\text{paper(electricity)}}$ and $P_{\text{paper(fuel)}}$ for paper production are calculated using the following formulas:

$$P_{\text{paper_electricity}} = \frac{\text{Electricity}_{\text{consumed}}}{\text{Electricity}_{\text{reference}}}$$

$$P_{\text{paper_fuel}} = \frac{\text{Fuel}_{\text{consumed}} - 1.25 \cdot \text{in-house generated electricity}}{\text{Fuel}_{\text{reference}}}$$

The following reference values for kraft paper must be used:

$$\text{Electricity}_{\text{reference}} = 1600 \text{ kWh/ADt}$$

$$\text{Fuel}_{\text{reference}} = 2100 \text{ kWh/ADt}$$

Verification

Calculation of energy score. The calculation sheet produced by Nordic Ecolabelling can be used.

Energy score when a mixture of different pulp types are used

The following formulas are used to calculate the energy score when a mixture of different pulp types are used:

$$P_{pulp_electricity} = \sum_{i=1}^n P_{pulp_electricity_i} \cdot pulp_i$$

$$P_{pulp_fuel} = \sum_{i=1}^n P_{pulp_fuel_i} \cdot pulp_i$$

$Pulp_i$ is the percentage of the individual pulp relative to the total pulp mixture. Due to wastage and differences in water content, the sum total of the pulp may be greater than 1. $P_{pulp(electricity)_i}$ is the energy score for electricity for pulp i . $P_{pulp(fuel)_i}$ is the energy score for fuel for pulp i .

Verification

Calculation of energy score. The calculation sheet produced by Nordic Ecolabelling can be used.

Total energy score for paper and pulp production

The total energy score for both electricity and fuel consumption for the paper production, including pulp production, is calculated using the formulas below:

$$P_{electricity} = P_{electricity_pulp} + P_{electricity_paper}$$

$$P_{fuel} = P_{fuel_pulp} + P_{fuel_paper}$$

The amount of fuel used to produce electricity in the pulp mill must be deducted by the paper manufacturer from the values received from the pulp producer using a factor of 1.25.

Worst case calculations must be included to show that each pulp recipe meets the requirements if no specific calculations are reported for each pulp mixture.

Verification

The documentation must include calculations with sub-totals. The base values used for consumed fuel and electricity must be stated. Worst case calculations must be included to show that each pulp recipe meets the requirements if no specific pulp-mixture calculations are reported for each pulp mixture present. The calculation sheet produced by Nordic Ecolabelling can be used.

Energy score for pulp production

Energy scores for $P_{pulp(electricity)}$ and $P_{pulp(fuel)}$ for paper production are calculated using the following formulas:

$$P_{pulp_electricity_i} = \frac{Electricity_{consumed}}{Electricity_{reference}}$$

$$P_{pulp_fuel_i} = \frac{Fuel_{consumed} - 1.25 \cdot in - house\ generated\ electricity}{Fuel_{reference}}$$

The table below shows the reference values for electricity and fuel:

Table 1 Reference values pulp

Process	Fuel kWh/t, Ref. value	Electricity kWh/t, Ref. value
Bleached chemical pulp	3600	650
Dried, bleached chemical pulp	4600	700
Unbleached chemical pulp	3200	550
Dried, bleached chemical pulp	4200	600
NSSC	3200	700
Dried NCCS	4100	750
CTMP	N/A	1500
Dried CTMP	900	1500
DIP	300	450
Dried DIP	1200	500
TMP	N/A	2200
Dried TMP	900	2250
Slip	N/A	2000
Dried slip	900	2050

Verification

Calculation of energy score. The calculation sheet produced by Nordic Ecolabelling can be used.

Table 2 Steam table

Enthalpy in gauged steam, h'' , as a function of absolute pressure, p or temperature, t. Enthalpy is divided by an efficiency of 0.9 and added to the heat consumption.

p Bar	t 0C	h'' KJ/kg	p bar	t 0C	h'' KJ/kg
0.50	81.3	2646.0	16.0	201.4	2791.7
0.60	86.0	2653.6	17.0	204.3	2793.4
0.80	93.5	2665.8	18.0	207.1	2794.8
1.00	99.6	2675.4	19.0	209.8	2796.1
1.20	104.8	2683.4	20.0	212.4	2797.2
1.40	109.3	2690.3	22.0	217.2	2799.1
1.60	113.3	2696.2	24.0	221.8	2800.4
1.80	116.9	2701.5	26.0	226.0	2801.4
2.00	120.2	2706.3	28.0	230.1	2802.0
2.50	127.4	2716.4	30.0	233.0	2802.3
3.00	133.5	2724.7	32.0	237.5	2802.3
3.50	138.9	2731.6	34.0	240.9	2802.1
4.00	143.6	2737.6	36.0	244.1	2801.7
4.50	147.9	2742.9	38.0	247.3	2801.1
5.00	151.8	2747.5	40.0	250.3	2800.3
6.00	158.8	2755.5	45.0	257.4	2797.7
7.00	165.0	2762.0	50.0	263.9	2794.2
8.00	170.4	2767.5	55.0	269.9	2789.9
9.00	175.4	2772.1	60.0	275.6	2785.0
10.00	179.9	2776.2	65.0	280.8	2779.5
11.00	184.0	2779.7	70.0	285.8	2773.5
12.00	188.0	2782.7	80.0	295.0	2759.9
13.00	191.6	2785.4	90.0	303.3	2744.6

14.00	195.0	2787.8	100.0	311.0	2727.7
15.00	198.3	2789.9	110.0	318.1	2709.3

Source: Thermal Engineering Data, which refers to Schmidt, E.: Properties of water and Steam in SI.Units, 1969. Springer-Verlag and R. Oldenbourg 1969.

Appendix 3 Energy calculations for production of panels, laminate, CLT and glulam

The following applies to the energy calculation in the production of wood-based panels, laminate, panels based on other renewable raw materials, CLT and glulam:

1. Energy consumption is calculated as an annual average for the entire business or the production line that is relevant for Nordic Swan Ecolabelled construction panels, laminate, CLT or glulam.
2. Energy consumption calculated as MJ/kg per panel/product must include the primary panel/product production and production of the main raw materials contained in the panel/product. The main raw materials are raw materials that make up more than 2% by weight of the finished panel/product (e.g. wood fibre and adhesive).

System delimitation for calculation:

- The calculation should not include the energy consumption for extraction of raw materials.
- For the panel/laminate/CLT/glulam production, the energy calculation should be based on data from raw material handling through to the finished panel/product, prior to any surface treatment. This means the calculation does not include timber cultivation and felling, but includes drying the wood, conveyor belt operation at the sawmill and production line, and the actual panel production. Transport at all stages and the energy consumed in the surface treatment process should not be included. The calculation must include lamination of the panel.
- For production of chemicals, such as adhesives, the energy calculation must be based on data from production of both the adhesive and the constituent raw materials. The energy content of the raw material should not be included. In the absence of specific energy data for the adhesive, a value of 15 MJ/kg for adhesive (ready-to-use solution) can be used. If multiple subcontractors are used for the same type of raw material, basing the calculation on the most frequently used supplier is allowed.
- Where fuel energy is concerned, energy from purchased fuel, internally-produced fuel and energy from waste products must be included. Self-generated energy and excess energy that is sold off should be stated, but does not count as consumed energy in the calculation. Self-generated energy refers to energy (electricity and heat) not purchased from an external supplier. Internally-produced fuel sources and residual products are not counted as self-generated energy.