

Nordic Ecolabelling for
Exterior panels and cladding



Version 1.0 • 22 August 2023 – 01 October 2025

Content

What is a Nordic Swan Ecolabelled panel or cladding for exterior use?.....	4
Why choose the Nordic Swan Ecolabel?	4
What can carry the Nordic Swan Ecolabel?.....	5
How to apply	5
1.1 Terms and definitions	7
1.2 Overview of requirements	8
2 Product information.....	8
3 Environmental requirements	9
3.1 Mineral raw materials	9
3.2 Wood raw materials, paper, cardboard, and paper pulp	10
3.3 Resources	14
3.4 Energy.....	14
3.5 Requirements for chemical products.....	17
3.6 Emissions	25
4 Quality, properties, and maintenance of the product	27
5 Licence maintenance	28
Regulations for the Nordic Ecolabelling of products.....	29
Follow-up inspections.....	29
Criteria version history.....	29
Appendix 1 Analysis and test laboratories	
Appendix 2 Applicant's list of materials	
Appendix 3 Paper, cardboard, and pulp - recycled/certified fibers	
Appendix 4 Wood, veneer, bamboo, and cork	
Appendix 5 Recycled raw material	
Appendix 6 Energy requirements for paper and pulp production	
Appendix 7 Chemical products - generally	
Appendix 8 Specification of environmentally hazardous substances in chemical products	
Appendix 9 Declaration of VOC content of adhesive or product for surface treatment	
Appendix 10 Revised requirements for solid wood, veneer, bamboo, and cork	

114 Exterior panels and cladding, version 1.0, 22 August 2023

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

Addresses

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

Denmark

Ecolabelling Denmark
Fonden Dansk Standard
Göteborg Plads 1, DK-2150 Nordhavn
Fischersgade 56, DK-9670 Løgstør
Tel: +45 72 300 450
info@ecolabel.dk
www.svanemaerket.dk

Iceland

Ecolabelling Iceland
Norræn Umhverfismerking
á Íslandi
Suðurlandsbraut 24
IS-108 Reykjavík
Tel: +354 591 20 00
svanurinn@ust.is
www.svanurinn.is

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

Finland

Ecolabelling Finland
Annankatu 25, 6. Flr
FI-00100 Helsingfors
Tel: +358 9 61 22 50 00
joutsen@ecolabel.fi
www.ecolabel.fi

Norway

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

Sweden

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

What is a Nordic Swan Ecolabelled panel or cladding for exterior use?

Nordic Swan Ecolabelled panels and cladding for exterior use have a reduced environmental and climate impact throughout their lifecycle – and strict requirements for recycled materials, chemicals and quality promote circular economy.

Nordic Swan Ecolabelled panels and cladding for exterior use:

- Are made of a high proportion of renewable and/or recycled materials*.
- Wood-based panels consist of timber that is legally harvested and certified under a traceability system. Furthermore, at least 70% of the timber is sourced from certified forestry.
- Meet strict requirements for chemicals used in production and for surface treatment. This means, for example, that antibacterial substances and halogenated flame retardants cannot be added.
- Have reduced climate impact which is achieved by meeting strict requirements for energy consumption.
- Are of good quality and properties are documented. This means that the panels and cladding comply with harmonised standards in accordance with the Construction Products Regulation (EU/305/2011) or voluntary CE marking according to ETA.

** Except from cement-based panels which consist of minimum 30% recycled materials.*

Why choose the Nordic Swan Ecolabel?

- Exterior panels and cladding may use the Nordic Swan Ecolabel trademark for marketing. The Nordic Swan Ecolabel is a very well-known and well-reputed trademark in the Nordic region.
- The Nordic Swan Ecolabel is a simple way of communicating environmental focus and commitment to customers.
- The Nordic Swan Ecolabel clarifies the most important environmental impacts and thus shows how a company can cut emissions, resource consumption and waste management.
- Environmentally suitable operations prepare exterior panels and cladding for future environmental legislation.
- Nordic Ecolabelling provides businesses with guidance on the work of environmental improvements.
- The Nordic Swan Ecolabel not only covers environmental issues 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?

The product group includes panels in which the main function is one or more of the following: outdoor cladding of buildings, outdoor construction panels, facade panels and panels for production of outdoor furniture, etc.

The following material types are included in the product group:

- Wood-based panels according to EN 13986, service class 3 (exterior use)
- Panels based on renewable raw materials other than wood
- Laminate such as HPL (High Pressure Laminate) or compact laminate according to the EN 438 series.
- CLT (cross laminated timber) according to EN 16351
- Cement-based panels
- Mineral wool panels (where the main function is not thermal insulation)

The product group does not include the following products:

- Panels/cladding with total more than 15% by weight of materials other than the above are not included in the product group
- Panels or cladding in which the main function is to insulate against heat or cold loss. Panels which are marketed as insulation panels or insulation products are thus not included
- Wet room panels
- Magnesium oxide panels for exterior use
- Roofing panels (outer roof)
- Fully prefabricated wall elements e.g., wall systems complete with structural framing, water/air/vapor barrier(s), insulation, and interior/exterior panels.
- Flooring, as these can be ecolabelled according to the criteria for Nordic Ecolabelling of Floor coverings*.
- Facade panels in solid wood, as these can be ecolabelled according to the criteria for Nordic Ecolabelling of for Durable Wood*.

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

If there is a desire for ecolabelling other types of panels than those covered by the product group definition, 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.

Nordic Ecolabelling determines whether a product can be Nordic Swan Ecolabelled, and under which criteria a product can apply for a licence.

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 2.

What is required?

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

In this criteria document 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

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 visit 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. Look first in this document for addresses. Further information and assistance (such as calculation sheets or electronic application help) is available. Visit the relevant national website for further information.

1.1 Terms and definitions

Words/terms	Definitions
Chemical products	Chemical products mean liquid products, e.g. for surface treatment, additives, glues and other adhesives.
Contamination limit	Impurities include residues from production incl. raw materials production which are found in adhesive, paint, additives, and other chemical products in concentrations below 100 ppm (0.0100% by weight, 100 mg/kg), but not substances intentionally added to a raw material or product for a purpose, regardless of quantity. However, impurities at the raw material level at concentrations of over 1.0% of the raw material will be regarded as an ingoing substance. Known substances realised from the raw materials are also regarded as ingoing substances.
Ingoing substance:	Unless otherwise stated, ingoing substances are defined as all substances in the product, including additives to the raw materials/ingredients (e.g. preservatives or stabiliser), but not impurities from production incl. raw material production.
Material	Materials means the constituent materials such as wood, paper, cardboard, pulp, plastic, mineral raw materials, metal, etc.
Panel types	<p>The following panel types are used in the criteria:</p> <ul style="list-style-type: none"> - Wood based panels with or without laminate coating according to EN 13986, class 3 - Solid wood (untreated and surface treated) which are joined to an interior panel, for example when installed by the consumer - Panels based on other renewable raw materials than wood - Laminate such as HPL (High Pressure Laminate) or compact laminate according to the EN 438 series. - CLT (cross laminated timber) according to EN 16351 - Mineral wool panels (where the main function is not thermal insulation) - Cement-based panels according to EN 12467 <p>The main material (material with the greatest percentage by weight) determines which of these panel types, the panel belongs to in terms of the resource and energy requirement.</p> <p>In addition, the energy requirement for paper shall be documented for all panel types where the paper/cardboard portion represents more than 30% by weight of the finished panel.</p> <p>Self-produced energy: Refers to energy (electricity and heat) which is 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 quantity sold is deducted from the energy consumption. Internally produced fuel sources and residues are not counted as self-produced energy.</p>
Self-produced energy	Refers to energy (electricity and heat) which is 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 quantity sold is deducted from the energy consumption. Internally produced fuel sources and residues are not counted as self-produced energy.

1.2 Overview of requirements

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

Section	Level	Requirement	Appendix	Relevant
Product information	Information about the product	O1	2	For all
Mineral raw materials Applies in cases with more than 10% by weight in the product.	Mineral raw materials	O2-O3	-	Yes <input type="checkbox"/> No <input type="checkbox"/>
Wood raw materials, paper, cardboard, and paper pulp Applies in cases with more than 5% by weight in the product.	Wood fibres, cardboard, and pulp	O4	3	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Solid wood, veneer, bamboo, and cork	O5-O7	4	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Revised req. for solid wood, veneer, bamboo, and cork	O6-O7	10	Yes <input type="checkbox"/> No <input type="checkbox"/>
	COD from paper and cardboard	O8	-	Yes <input type="checkbox"/> No <input type="checkbox"/>
Resources	Cement-based and mineral wool panels	O9	5	Yes <input type="checkbox"/> No <input type="checkbox"/>
Energy requirements	Energy requirements for paper and pulp production Applies in cases with more than 30% by weight in the product.	O10	6	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Energy requirements for different types of panel/mouldings	O11-O14	-	Yes <input type="checkbox"/> No <input type="checkbox"/>
Chemical products	General	O15-O19	7	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Nanoparticles	O20	7	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Environmental hazard	O21	8	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Environmental hazard in surface treatment	O22	8	Yes <input type="checkbox"/> No <input type="checkbox"/>
	VOC in adhesives	O23	9	Yes <input type="checkbox"/> No <input type="checkbox"/>
	VOC in surface treatment	O24	9	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Free formaldehyde	O25	7	Yes <input type="checkbox"/> No <input type="checkbox"/>
Emissions	COD (wet processes in panel/moulding production)	O26	-	Yes <input type="checkbox"/> No <input type="checkbox"/>
	HPL production	O27	-	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Dust emissions	O28	-	Yes <input type="checkbox"/> No <input type="checkbox"/>
Information and quality	General	O29-O30	-	For all
Licence maintenance	General	O31-O32	-	For all

2 Product information

This chapter contains product specifications such as description of the product, material composition and production methods/process.

O1 Information about the product(s)

The applicant must submit the following information about the product(s):

- Brand name(s) and trade name(s).
 - Description of product(s) included in the application). A product datasheet or similar for each product must be forwarded.
 - Description of manufacturing process of the product. Subcontractors must be described with company name, production location, contact person and the production processes used.
 - For each product: Attach a list of materials and chemical products used in producing the product and any surface treatment of the product. The list must contain the weight percentage of the constituent materials/chemical products in the panel. Safety datasheets for each chemical product must be included.
- ☒ Any information requested by the requirement. A product datasheet may be sent as part of the documentation. Information about materials, cf. Table 2 in Appendix 2, must be given. It is possible to use a separate Excel spreadsheet corresponding to Table 2 in Appendix 2 as a materials list.
- ☒ Table 1 in Appendix 2 should be completed and forwarded by the applicant for each product.

3 Environmental requirements

The requirements apply to mineral raw materials and mineral byproducts (e.g. fly ash) which make up more than 10% by weight of the finished panel/moulding.

3.1 Mineral raw materials

02 Heavy metals

Mineral raw materials or mineral byproducts must as a maximum contain the following quantities of heavy metals as indicated in the table below in accordance with the used test method.

Table 1: Requirement level for heavy metal content by either partial opening or total opening of the test sample

Heavy metal	Partial opening of the test sample EN 259 Maximum content mg/kg	Total opening of the test sample EN 13656 Maximum content mg/kg
Arsenic	10	30
Lead	25	25
Cadmium	1	10
Mercury	0,5	0,5
Chrome (total)	300	300

- ☒ The declaration from the raw materials producer/-refiner, containing measurement results, measurement methods and measurement frequency. For the description of the measurement method, see Appendix 1.

O3 Dust emissions

The production and refining of mineral raw materials must not generate dust emissions to the atmosphere (via a chimney) of more than 7 mg dry dust/m³ air and 21 mg wet dust/m³ air.

For a description of the measurement method, see section on dust emissions in Appendix 1.

- ☒ The declaration from the raw materials producer/refiner, containing measurement results, measurement methods and measurement frequency.

3.2 Wood raw materials, paper, cardboard, and paper pulp

The following requirements cover wood fibres, paper, cardboard, paper pulp, veneer, and solid wood, as used in the product where the raw materials individually constitute more than 5% by weight of the finished panel.

For solid wood, veneer, bamboo and cork, the applicants can choose to fulfil and verify either requirements O5 and O6 below or new forestry requirements (both A and B) in appendix 10. It is not possible to mix between the two sets of requirements O5/O6 and A/B in appendix 10.

Requirement O4, O7 and O8 is valid regardless of which set of requirements (O5/O6 or appendix 10), that has been fulfilled.

O4 Wood fiber and waste wood in paper, cardboard and pulp

The requirement covers raw materials purchased as wood fibre in paper, cardboard, and pulp. The requirement does not apply to paper labels attached to the product.

Nordic Swan Ecolabelled paper products as well as pulp and paper controlled under the existing Nordic Ecolabel basic module for paper, is automatically approved in this requirement.

Every year, at least:

1. 30% of the fibre raw material in paper, cardboard or pulp must come from forest areas in which operation has been certified under the forestry standard and certification system stated in Appendix 4c or which is certified as organically cultivated or where cultivation is in the process of being converted to organic production,
- or
2. 70% of the fibre raw material in paper, cardboard or pulp must be recycled fibre or biproducts such as shavings or sawdust,
- or
3. a combination of 1 and 2. If the fibre raw material in paper, cardboard or pulp consists of less than 70% recycled fibre, the proportion of fibre raw material from certified areas must be calculated according to the following formula:
4. Requirement for proportion of fibre raw material from certified areas in paper, cardboard, or pulp (Y):
5. $Y (\%) \geq 30 - 0.4x$

6. where x = proportion of recycled fibre or biproducts such as shavings and sawdust.

- ☒ The declaration and any calculations from the supplier of the paper, cardboard or pulp that the requirement has been satisfied. The declaration must contain the name of the paper, cardboard, or pulp. Appendix 3 may be used.
- ☒ Where points 1 or 3 apply, the paper, cardboard or pulp manufacturer must send a copy of the relevant forestry certificate which complies with the guidelines for forest certification and organic cultivation, as described in Appendix 4c.
- ☒ By using the Nordic Swan Ecolabelled paper, cardboard or pulp submit trade name and license number of the product. When using products controlled by the existing Nordic Ecolabel paper basic module the producer, production plant, name of mass or paper quality and grammage shall be described.

O5 Solid wood, veneer, bamboo, and cork - origin and traceability

Constituent raw materials of solid wood, veneer, bamboo, cork and fibre products in the panels or cladding must comply with the following requirements.

The licensee must:

- demonstrate traceability for all wood, veneer, and bamboo materials.
- state the name (in Latin and one Nordic language) and geographic origin (country/state and region/province) of the kinds of wood and bamboo used.
- have a written procedure for sustainable wood and bamboo supply.

Wood, veneer, and bamboo raw materials may not be sourced from:

- protected areas or areas in the process of being awarded protected status.
- areas where ownership or usage rights are unclear.
- genetically modified trees or plants.

Furthermore, forestry operations must not damage:

- standing natural timber, biodiversity, special ecosystems, or important ecological functions.
- important social and/or cultural values.

Secondary raw materials from trees, e.g., palm leaves, are exempted from the requirement.

Residues and waste from other activities in the form of sawdust/wood chips/wood waste/untreated demolition wood and recycled wood fibres are exempt from this requirement. This requires, however, a statement from the supplier, that the raw material is residues, waste or recycled.

Nordic Ecolabelling may require further documentation in case of uncertainty about the raw materials origin.

- ☒ Name (Latin and a Nordic language or English) and geographical origin (country/state and region/province/municipality) for the wood raw materials used. Appendix 4a must be used.

- ☒ The traceability system must be described. The Chain of Custody Certificate or certificate number on Traceability Certification may be used as documentation for point 2.
- ☒ Written routines for ensuring sustainable bamboo and wood supply. A requirement for a Chain of Custody Certificate from a supplier may be used as part of the procedure. The procedure must ensure updated lists of all suppliers.
- ☒ For residual, waste or recycled wood raw materials, a statement confirming this must be submitted.

O6 Certified solid wood, veneer, and bamboo

The requirement applies to solid wood, veneer, bamboo, and cork included as raw material in the panel/moulding.

70% by weight of all solid wood, veneer, bamboo, and cork must come from certified forests. Alternatively, the bamboo may be organically cultivated, or the cultivation may be in the process of conversion to organic production. See the description in the background document to this requirement of which systems are accepted here.

The requirement may be documented as purchased wood, bamboo, and cork on an annual basis either for the whole company or the Nordic Ecolabelled production alone (minimum 70% certified wood must be credited to the Nordic Ecolabelled production).

Certification must be performed by an independent third party.

Certification must be to a valid forestry standard, which fulfils the requirements for standards and certification systems laid down in Appendix 4c.

Secondary raw materials from trees, e.g., palm leaves, are exempted from the requirement.

Residues and waste from other activities in the form of wood waste and untreated demolition wood and recycled wood are exempt from this requirement. This requires, however, a statement from the supplier, that the raw material is residues, waste or recycled.

- ☒ The proportion (%) of certified wood or bamboo included in the applicant's annual Nordic Ecolabelled production. Appendix 4b may be used.
- ☒ Copy of forestry certificated signed and approved by a certification body or stating the certificate number.
- ☒ Nordic Ecolabelling may require further documentation to assess whether the requirements for standards, certification system and certified proportion have been satisfied.
E.g., a copy of the certification body's approval report, a copy of the forestry standard including name, address and telephone number of the organisation which drew up the standard, and references to persons who represent the parties and interest groups invited to participate in the development of the forest standard.
- ☒ For residual, waste or recycled wood raw materials, a statement confirming this must be submitted.

07 Use of biocides in tree and bamboo felling

The requirement applies to solid wood, veneer, and bamboo as constituent raw materials.

After felling, the wood must not be treated with pesticides with WHO classifications 1A and 1B.

The requirement relates to the treatment of logs after felling.

WHO classification: An overview can be obtained from internet address http://www.who.int/ipcs/publications/pesticides_hazard/end, "The WHO recommended classification of pesticides by hazard and guidelines to classification 2009" or on application to one of the secretariats.

- A statement from the wood suppliers as to the pesticides used and a declaration in accordance with Appendix 4a for each product.

08 Emissions of COD from paper and cardboard production

The total emissions of acid-consuming organic material (COD - chemical oxygen demand) to water must be less than the specified COD value in the table below for the paper or cardboard used (for unfiltered sample). Each type of pulp has its own level in the requirement. The COD emission from pulp production must be included in the total COD calculation for the paper or cardboard used.

COD emissions is thus calculated by adding the emissions COD mass kg/ADT (weighted mean of incoming pulps) + COD emission paper machine kg/t.

Nordic Swan Ecolabelled paper products as well as pulp and paper controlled under the existing Nordic Ecolabel basic module for paper, is automatically approved in this requirement.

Table 2: COD requirement levels for different pulp and paper types

Pulp type	Total COD level kg/ADt for pulp and paper
Bleached chemical pulp (sulphate and other chemical pulps except sulphite pulp)	22.0
Bleached chemical pulp (sulphite pulp)	29.0
Unbleached chemical pulp	14.0
CTMP pulp	19.0
TMP/Ground wood pulp	7.0
Recycled fibre pulp	4.0

- Submit a description of the sampling programme, including measurement methods, measurement results from previous 12 months and measurement frequency, see also Section 1 of Appendix 1.
- By using the Nordic Swan Ecolabelled paper, cardboard or pulp submit trade name and license number of the product. When using products controlled by the existing Nordic Swan Ecolabel paper basic module the producer, production plant, name of mass or paper quality and grammage shall be described.

3.3 Resources

O9 Resource requirements for cement based and mineral wool panels

As a minimum there must be 30% by weight recycled or renewable material in the panel. The requirement may be documented annually for the panel production.

For mineral wool panels an exemption is given from this requirement if the reduced energy requirement of 10 MJ/kg in requirement O13 can be fulfilled.

In this requirement recycled raw materials are defined as post-consumer, cf. definition in ISO 14021 and waste products such as fly ash and industrial slag.

- ☒ A declaration from the recycled materials supplier, showing the amount of recycled material received in accordance with the requirement. Appendix 5 may be used.
- ☒ Applicant's calculation showing that the requirement level has been reached.

3.4 Energy

The energy requirements include the final energy consumption. The requirements must be documented in the form of energy consumed without the use of primary energy factors. The Nordic Swan Ecolabelled panel/cladding must comply with either requirement O10 - O14, depending on the material in the panel/moulding.

Please note that although the requirements below refer to panel production, the requirements also apply to cladding produced in the corresponding material.

Furthermore, the energy requirement for paper and pulp will be activated, when more than 20% by weight of paper or pulp in the finished panel/cladding. The energy requirement for paper and pulp O10 is explained in detail in Annex 6. All energy requirements are further explained in the background document.

O10 Energy requirements for paper and pulp production

The requirement covers paper and pulp which individually are present at more than 30% by weight in the finished panel/moulding.

Nordic Swan Ecolabelled paper products as well as pulp and paper controlled under the existing Nordic Ecolabel basic module for paper, is automatically approved in this requirement.

The following requirements must be satisfied for paper or pulp:

P electricity(total) < 1.25

P fuel(total) < 1.25

P stands for energy point for paper/pulp production. In P electricity(total) and P fuel(total), energy points are included from both paper production and the pulps used in the paper. See further explanation in Appendix 6.

- ☒ The pulp and paper manufacturer must submit a calculation according to Appendix 6, which shows that the points limits are being satisfied. The calculation sheet developed by Nordic Ecolabelling must be used for the calculation.

- ☒ By using the Nordic Swan Ecolabelled paper, cardboard or pulp submit trade name and license number of the product. When using products controlled by the existing Nordic Ecolabel paper basic module the producer, production plant, name of pulp or paper quality and grammage shall be described.

O11 Energy requirements for HPL panel production:

The requirement covers the applied energy for production of the panel and may be documented either for the Nordic Ecolabelled panel production or for the company's total annual production of HPL panels.

HPL panels ≤ 2 mm thin:

No more than 18 MJ/kg panel may be used for producing the panel.

HPL panels > 2 mm thick:

No more than 14 MJ/kg panel may be used for producing the panel.

The requirement does not include extraction of resources or production of incoming raw materials. Paper has its own energy requirements in O10. Self-produced energy and resold surplus energy should be stated but will not count as applied energy in the calculation.

- ☒ A calculation should be submitted documenting compliance with the requirement. The calculation must contain information about: quantity of produced panels, sub-divided into thick and thin, applied electricity and fuel, and which fuel sources are being used.

O12 Energy requirements for wood-based panels

Energy consumption is calculated as an annual average for either just the Nordic Ecolabelled production or for the whole enterprise. Energy consumption calculated as MJ/kg panel must include the primary panel production and the production of the constituent main raw materials. Main raw materials are the raw materials which make up more than 2% by weight of the finished panel (for example wood fibre and adhesive).

System boundary for the requirement:

Energy consumption for obtaining raw materials is not included in the calculation. For the panel production, the energy calculation must be based on data available from the time of raw materials handling (including drying of wood and conveyor belts both in the saw works and on the production line) up to the finished product prior to any surface treatment. The calculation is thus exclusive cultivation and felling the tree, but including wood drying and conveyor both at the sawmills and in the production line and the panel production. Transport in all phases and energy consumption by surface treatment should not be included. Lamination of the panel should be included in the calculation.

Energy consumption for surface treatment must not be included. In production of chemicals such as adhesives, the energy calculation is based on data available from the time of the production of the adhesive and of the constituent raw materials. The energy content of the raw material must not be included. In exceptional cases, a table value for adhesive of 15 MJ/kg (ready-to-use solution) may be used.

When using multiple suppliers for the same type of raw material it is accepted, that the calculation is done using the most frequently used supplier.

Chipboards:

No more than 7 MJ/kg panel may be applied for producing panels (excluding any surface treatment).

Other wood-based panels:

No more than 11 MJ/kg panel may be applied for producing panels (excluding any surface treatment).

In relation to fuel energy, then both energy from purchased fuel, domestically produced fuel and energy from waste products are included. The requirement does not include extraction of resources. Self-produced energy and resold surplus energy should be stated but will not count as applied energy in the calculation.

- ☒ A calculation should be submitted documenting compliance with the requirement. The calculation must contain information about: quantity of produced panels, applied electricity and fuel, and which fuel sources are being used.

O13 Energy requirements for mineral wool production

The requirement covers the applied energy for production of the panel incl. the production of mineral wool. The requirement may be documented either just for the Nordic Ecolabelled panel production or for the company's total annual production.

In total, no more than 20 MJ/kg mineral panel may be applied for electricity and fuel.

For panels, that do not comply with the requirement for recycled material in O9, applies a maximum level of 10 MJ/kg panel.

The requirement does not include extraction of resources. Self-produced energy and resold surplus energy should be stated but will not count as applied energy in the calculation. See terms and definition of self-produced energy.

- ☒ A calculation should be submitted documenting compliance with the requirement. The calculation must contain information about: quantity of produced panels, applied electricity and fuel, and which fuel sources are being used.

O14 Energy requirements for cement-based panels

The requirement covers the total energy impact from the constituent materials in the panel. The requirement covers all materials used in the panel which are present at more than 1% by weight. To calculate this, table values are applied from table below for each material, weighting them in proportion to the amount of material present in the finished panel.

Requirement for panels and cladding for exterior use: No more than 10 MJ/kg panel may be applied.

The table values express the energy impact of the material with the system limit cradle to gate, e.g., the calorific value. It is not permitted to use privately obtained values.

Nordic Ecolabelling reserves the right to assess which table values are to be used when using materials not specifically laid down in the table or in case of doubt over choice of table value.

Portland cement is defined in accordance with Standard EN 197-1.

Table 3 Table value for energy for material production cradle to cradle.

Material	Primary energy MJ/kg (both renewable and fossil-based)
Portland Cement	8
Kaolin	5.4
Fly ash (hard coal ash from furnace)	0.4
Limestone flour	0.4
Silicate sand	0.6
Aluminium hydroxide	10
Magnesium oxide	2.7
Magnesium chloride (value for MgO)	2.7
Pozzolanic Filler	83
Residual wood (hardwood u=80% moisture content dry basis)*	5
Residual wood (softwood u=140% moisture content dry basis)	2
Sawdust (chips u=70% moisture content dry basis)*	2
Wood chips (chips u=70% moisture content dry basis)*	1.5
PVA fibre (synthetic fibre)	202
Clay, expanded	4.8
Glass Foam	25.2
Fibreglass	35.2
Polyacrylonitrile (PAN) fibre	82
Other plastic fibres	200

* 70% "moisture content dry basis" means 0.7 m³ water per 1 m³ dry wood. This is the same as a moisture content of 41% "moisture content wet basis". In the case of a different moisture content in the wood raw material, a conversion must be made by using an energy figure for dry wood, which would be 2.5 MJ/kg dry substance wood (water content of 0%) for wood chips. A similar conversion must be made for other wood raw materials.

- ☒ A calculation should be submitted documenting compliance with the requirement.

3.5 Requirements for chemical products

The requirements cover the chemical products included in the production of the Nordic Swan Ecolabelled panels/cladding. Either as additives to the panel/moulding or in surface treatments.

The requirement relates to chemical products such as adhesive, additives and surface treatment. Auxiliary chemicals such as lubricating oil for mechanical equipment are not covered by the requirement.

Several of the requirements are aimed at the ingoing substances in the chemical product. See terms/definition for ingoing substance.

O15 Ecolabelled product

If the product is Nordic Ecolabelled, all requirements in section 2.5 except of O21, O22 and O24 are automatically fulfilled.

- ☒ If the product is Nordic Ecolabelled, the product type and manufacturer and license number must be specified.

O16 Classification of the chemical product

The chemical product used in the production of the Nordic Swan Ecolabelled panel/moulding must be classified in accordance with the current legislation (CLP Regulation 1272/2008 or the EU's Dangerous Preparations Directive 1999/45/EEC 2008, or later) and may not be classified in accordance with table below.

Exemptions:

- Resins in HPL panels/cladding with up to max. 10% phenol are exempted from the prohibition of classification with H341/R68 and H301, H331/R23, R24, R25, R48.
- Adhesives with methylene diphenyl diisocyanate (MDI) are exempted from the prohibition of classification with H351/R40.
- An exemption for the classification from formaldehyde are given in this requirement. The formaldehyde content in chemical products is instead regulated in requirement O25. Emissions from HPL production is regulated in requirement O27.
- Methanol in concentrations up to 10% by weight in adhesives and resins are exempted from the prohibition of classification according to the requirement.
- Resins with melamine are exempted from the prohibition of classification with H351 and H361.

CLP Regulation 1272/2008		EU Dangerous Substance Directive 67/548/EC	
Signal words	Hazard statement	Indication of danger	Risk phrase
Danger, Carc. 1A or 1B Danger, Carc. 1A or 1B Warning, Carc. 2	H350 H350i H351	Carcinogenic T T Xn	R45 and/or R49 R40
Danger, Muta. 1A or 1B Warning, Muta. 2	H340 H341	Mutagenic T Xn	R46 R68
Danger, Repr. 1A or 1B Danger, Repr. 1A or 1B Warning, Repr. 2 Warning, Repr. 2 - -	H360 H360 H361 H361 H362 H362	Reprotoxic T T Xn Xn - -	R60 R61 R62 and/or R63 R33 R64

Danger, Acute Tox. 1 or 2	H330		Very toxic Tx	R26
Danger, Acute Tox. 1	H310		Tx	R27
Danger, Acute Tox. 2	H300		Tx	R28 and/or
Danger, STOT SE 1	H370		Tx	R39
Danger, Acute Tox. 2 or 3	H330 or H331		Toxic T	R23
Danger, Acute Tox. 3	H331		T	R24
Danger, Acute Tox. 3	H301		T	R25
Danger, STOT SE 1	H370		T	R39 and/or
Danger, STOT RE 1	H372		T	R48

The classification applies in accordance with the EU's Dangerous Substances Directive 67/548/EC with subsequent amendments and adjustments and/or CLP Regulation 1272/2008 with subsequent amendments. During the transition period, i.e. up to 1 June 2015, classification in accordance with the EU's Dangerous Substances Directive or the CLP Regulation may be used. After the transition period, only classification in accordance with the CLP Regulation is allowed.

- Declaration from the producer of the chemical product used in the Nordic Ecolabelled product that the requirement has been satisfied. Appendix 7 may be used.
- A safety data sheet for the chemical product used in the Nordic Ecolabelled product in accordance with Appendix II of Reach (Regulation 1907/2006/EC with subsequent amendments and additions).

O17 CMR classification of constituent substances

The requirement covers all constituent substances in the chemical products used in production of the panel and for surface treatment.

The constituent substances used in chemical products in panel production (e.g. additives, adhesives and surface treatment) must not have any classifications listed in the table below.

Exemptions:

From 04/01/2015 formaldehyde is up classified under CLP ATP 6 (EU no. 605/2014) then an exemption for formaldehyde with H350 (Carc.1B)/R45 and/or R49 and H341 (Muta.2)/R68 are given in this requirement. The formaldehyde content in adhesives is instead regulated in requirement O25. Emissions from HPL production is regulated in requirement O27.

CLP Regulation 1272/2008:		EU Dangerous Substance Directive 67/548/EC	
Signal words	Hazard statement	Indication of danger	Risk phrase
Danger, Carc. 1A or 1B Danger, Carc. 1A or 1B	H350 H350i	Carcinogenic T T	R45 and/or R49
Danger, Muta. 1A or 1B	H340	Mutagenic T	R46
Danger, Repr. 1A or 1B Danger, Repr. 1A or 1B	H360 H360	Reprotoxic T T	R60 R61

The classification applies in accordance with the EU's Dangerous Substances Directive 67/548/EC with subsequent amendments and adjustments and/or CLP Regulation 1272/2008 with subsequent amendments. During the transition

period, i.e., up to 1 June 2015, classification in accordance with the EU's Dangerous Substances Directive or the CLP Regulation may be used. After the transition period, only classification in accordance with the CLP Regulation is allowed.

- ☒ Declaration from the producer/supplier of the chemical product that the requirement has been satisfied. Appendix 7 may be used.

O18 Specific excluded substances in chemical products

The requirement covers all constituent substances in the chemical products used.

The following substances must not be present in the chemical product:

- Substances on the EU Candidate List*
 - Exemption applies to: melamine (CAS nr. 108-78-1)
- Persistent, bioaccumulative and toxic (PBT) organic substances**
- Very persistent and very bioaccumulative (vPvB) organic substances**
- Substances regarded as potentially endocrine-disrupting in category 1 or 2 on the EU
- Priority List of substances for further investigation for endocrine disrupting
- Effects***
- Halogenated organic compounds, such as organic chloroparaffins, fluorine compounds and halogenated flame inhibitors****
- Bisphenol A
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivatives
- Phthalates
- Aziridine and polyaziridines
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds

* *Candidate List pursuant to REACH, 1907/2006/EC Article 59, Par. 10 is available on the ECHA website: <http://echa.europa.eu/sv/candidate-list-table>*

** *PBT and vPvB substances are defined in Annex XIII of the Reach Regulation (Regulation 1907/2006/EG). Substances which meet the PBT or vPvB criteria or which liberate substances which meet these criteria are listed on <http://esis.jrc.ec.europa.eu/index.php?PGM=pbt>. Substances which have been “deferred” or are “under evaluation” are not deemed to possess PBT or vPvB properties.*

*** *Se following link:*

http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf (Annex L, page 238 ff.)

**** *The biocide bronopol Cas. Nr. 52-51-7 is exempted from this requirement up to 0,05% by weight. The biocide CMIT, in combination with MIT, is an exemption from this rule and is regulated by Requirement O21.*

- ☒ Declaration from the raw materials producer or supplier showing that the requirement has been complied with. Appendix 7 may be used.

O19 Biocides (preservatives and antibacterial treatments)

Antibacterial treatment (all types of panels and cladding)

- No biocides or biocide products may be applied to the surface of the finished panel/moulding, or to parts of these, for the purpose of providing a disinfectant or antibacterial effect.

Preservatives in chemical products (all types of panels/cladding)

- The total content of Kathon mixture (CMIT/MIT) 5-chloro-2-methyl-2H-isothiazolin-3-one (CAS no.: 26172-55-4) and 2-methyl-2H-isothiazolin-3-one (CAS no.: 2682-20-4) (3:1) in the chemical product may not exceed 15 ppm (0.0015% by weight, 15 mg/kg).

All types of panels/cladding (excluding surface treatment of panels):

- The total content of isothiazolinone compounds in the chemical product may not exceed 500 ppm (0.05% by weight, 500 mg/kg).
- The total content of 2-Methyl-3(2H)-isotiazolon in the chemical product may not exceed 200 ppm.

Surface treatment of panels and cladding for exterior use:

- For chemical products for surface treatment of panels/cladding, the total content of isothiazolinone compounds in the chemical mixture may not exceed 1500 ppm (0.15% by weight, 1500 mg/kg).

- ☒ Declaration from producer/supplier of all constituent chemical products, showing that the requirement has been met. Appendix 7 may be used.

O20 Nanoparticles

The product may not contain nanoparticles (from nanomaterial*)

Exemptions from the requirement are granted for the following:

- Pigment**
- Synthetic amorphous silicate***
- Naturally occurring inorganic fillers****
- Polymer dispersions

* *The definition of nanomaterials follows the EU Commission's definition of nanomaterials of 18 October 2011:*

"Nanomaterials": a natural, incidental, or manufactured material containing particles in an unbound state or as an aggregate or an agglomerate and where at least 50% of the particles in the size distribution by number, in one or more external dimensions, are in the size range of 1-100 nm.

** *Nano titanium dioxide is not considered to be a pigment and is therefore a subject to the requirement.*

*** *This applies to conventional synthetic amorphous silicate. Chemically modified colloidal silica can be included as long as the silica particles form aggregates in the finished product. Any surface treatment must meet the chemical requirements of the criteria.*

**** *This applies to fillers covered by Annex V Point 7 of REACH.*

- ☒ Declaration from producer/supplier of chemical product (except for polymer emulsion, pigment, and synthetic amorphous silicate) that the product does not contain nanomaterial as defined by the requirement. Appendix 7 may be used.

O21 Environmentally harmful substances in the panel (not surface treatment)

The total quantity of added chemical substances in the panel which are classified as environmentally harmful according to table below has been restricted and must comply with a required level of maximum 2% by weight environmentally harmful substances by means of the following formula:

- $100 \cdot H410 + 10 \cdot H411 + H412 \leq 2\%$ by weight environmentally harmful substances

or

- $100 \cdot (R50/53) + 10 \cdot (R51/53) + (R52/53) \leq 2\%$ by weight environmentally harmful substances

where:

H410 is the total concentration of substances classified as H410 (and the same for R50/53) as a percentage of the panel/moulding

H411 is the total concentration of substances classified as H411 (and the same for R50/53) as a percentage of the panel/moulding

H412 is the total concentration of substances classified as H412 (and the same for R50/53) as a percentage of the panel/moulding

The requirement relates to the chemical products used in the panel/moulding (e.g. adhesives) with the chemical composition they have when mixed in the panel/moulding material.

The following exemptions apply:

- Ammonia in a concentration of over 24% is exempted and not counted here.
- Phenol (CAS: 108-95-2) classified H411 in resins in HPL panels/moulding with up to a maximum of 10% by weight of phenol is excluded from the calculation. Note that there are requirements for emission of phenol in O27.
- Acrylates in UV-curing products are exempted from the calculation if the products are used in a controlled closed process where no discharge to recipient takes place. Spills and residual waste (e.g. residues from cleaning) must be collected in containers that are approved for hazardous waste and handled by a waste contractor.

Hazard class	Hazard code and hazard statement according to CLP Regulation 1272/2008	Indication of danger and R-phrase according to EU Dangerous Substances Directive (67/548/EC)
Hazardous to aquatic life	Chronic 1 with H410	N; R50-53
	Chronic 2 with H411	N; R51-53
	Chronic 3 with H412	R52-53

- ☒ Declaration from producer/supplier of chemical product showing the content of environmental hazard classified substances covered by the requirement, stated specifically for each indication of danger/R phrase. Appendix 8 may be used.

- ☒ Calculation from panel manufacturer showing the panel's content of environmentally hazardous substances in relation to the requirement. Here information from Appendix 8 should be used.
- ☒ For UV-curing products: a description of the process and how waste and residual waste are handled, including information on who receives the residual waste.

O22 Environmentally harmful substances in surface treatment

Chemical products used in the surface treatment system (e.g., coating, oil, paint and lacquer) of the panel/moulding must satisfy one of the two following requirement alternatives.

- a) No chemical product in the surface treatment may be classified as environmentally harmful according to Table below.

or

- b) The total amount of environmentally harmful substances applied (indicated in table below) in the surface treatment system must not amount to more than 40 g/m² calculated in wet condition.

Acrylates in UV-curing surface treatment products are exempted from a) and b) if the following is fulfilled:

UV curing surface treatment products must be applied to the material during a controlled closed process where no discharge to recipient takes place. Spills and residual waste (e.g. residues from cleaning) must be collected in containers that are approved for hazardous waste and handled by a waste contractor.

For alternative b) one of the following formulae must be used to calculate the weight percentage of constituent environmentally harmful substances in the surface treatment system (to be done as a total for all chemical product in the surface treatment):

- $100 \cdot H410 + 10 \cdot H411 + H412 =$ percent by weight environmentally harmful substances

or

- $100 \cdot (R50/53) + 10 \cdot (R51/53) + (R52/53) =$ percent by weight environmentally harmful substances

H410 is the concentration of substances classified as H410 (and the same for R50/53) as a percentage

H411 is the concentration of substances classified as H411 (and the same for R50/53) as a percentage

H412 is the concentration of substances classified as H412 (and the same for R50/53) as a percentage

All environmentally hazardous substances in unhardened chemical products must be included in the calculation.

Hazard class	Hazard code and hazard statement according to CLP Regulation 1272/2008	Indication of danger and R-phrase according to EU Dangerous Substances Directive (67/548/EC)
Hazardous for aquatic life	Aquatic acute 1 with H400	N; R50
	Aquatic chronic 1 with H410	N; R50-53
	Aquatic chronic 2 with H411	N; R51-53
	Aquatic chronic with H412	R52-53

The amount of applied environmentally hazardous substances (g/m²) is then calculated as:

Applied amount $\left(\frac{\text{g}}{\text{m}^2}\right) \times \% \text{ by weight environmentally hazardous substances in total surface treatment.}$

For tone systems, a worst-case calculation is made for the surface treatment with the most tone in the basic colour containing the most environmentally hazardous substance under the weighted formula for the classifications.

- ☒ For alternative a), a declaration is required from the producer/supplier of each chemical product that the product is not classified as environmentally hazardous under the above table. Appendix 7 may be used.
- ☒ For alternative b) Declaration from producer/supplier of chemical product showing the content of environmental hazard classified substances covered by the requirement. The concentration of substances must be stated specifically for each indication of danger/R phrase. Appendix 8 may be used. Confidential information from the chemicals supplier may be sent directly to Nordic Ecolabelling.
- ☒ The calculation from the manufacturer of the finished panel showing the number of coats of surface treatment, the application method and the applied amount per coat indicated as g/m² panel. And the weighted calculation of environmentally hazardous substances as shown by the requirement. Here information from Appendix 8 should be used.
- ☒ For UV-curing products: Description of the process and how waste and residual waste are handled, including information about who receives the residual waste from the performer of the surface treatment.

O23 Volatile organic compounds (VOC) in adhesives

Volatile organic compounds* including volatile aromatic hydrocarbons (VAH), must not be present in the adhesive by more than 3% by weight. Of these, VAHs (volatile aromatic hydrocarbons) may not amount to more than 0.1% by weight of the adhesive.

Resins/adhesives for HPL panel/moulding production are exempted from this requirement. Instead, the HPL panel/moulding shall fulfil emission requirements to formaldehyde and phenol and VOCs in general are set in requirement O27.

** Volatile organic compounds are here defined as:*

Organic compounds with a steam pressure exceeding 0.01kPa, at 20°C.

For products under EU Directive (2004/42/EC) in which steam pressure is not indicated:

Organic substances with an initial boiling point that is lower than or equal to 250°C measured at a normal pressure of 101.3 kPa.

- ☒ Declaration from the producer/supplier of the chemical compound that the requirement has been fulfilled. Appendix 9 may be used.

O24 VOC in surface treatment

The content of volatile organic substances (VOC) in the chemical products in the surface treatment system must be either:

- c) below 5% by weight for each chemical product, or
- d) a maximum of 10 g/m² surface of panel/moulding for the total surface treatment system

The requirement relates to the chemical products used in surface treatment with the chemical composition they have in wet form. If the product is to be diluted, the calculation must be based on the content of the ready-diluted product.

Volatile organic compounds are here defined as:

Organic substances with an initial boiling point that is lower than or equal to 250°C measured at a normal pressure of 101.3 kPa.

- ☒ Declaration from the producer/supplier of each chemical product in the surface treatment. The declaration must state the content of VOC in the product. If necessary, VOC information from the producer of the chemical product may be sent directly to Nordic Ecolabelling. Appendix 9 may be used.
- ☒ When using alternative b), the applicant must submit a calculation showing the total amount of VOC in the surface treatment system in g/m² panel/moulding. The calculation must be based on the declared VOC content of each chemical product and the amount present in the surface treatment system.

O25 Content of free formaldehyde in chemical products

The requirement does not apply to resin used for impregnation in HPL and laminate production. HPL and laminate production must instead comply with Requirement O27 Emissions from HPL production.

The content of free formaldehyde in chemical products used for production of the panel may be up to 0.2% by weight (2000 ppm), except for adhesive products mixed with hardener. For adhesive products mixed with hardener, up to 0.2% by weight (2000 ppm) of free formaldehyde is permitted in the ready-to-use mixture.

The content of free formaldehyde in chemical products used for stone wool may be no more than 0.5% by weight (5000 ppm).

- ☒ Declaration from the producer of the chemical products used in the construction panel/moulding. Appendix 7 may be used.

3.6 Emissions

O26 Emissions to water in wet processes

The requirement covers wet processes in panel/moulding production where organic material is included. For panels/cladding manufactured with wet processes, the COD emission to water may be no more than 20 g COD/kg product (unfiltered sample).

- ☒ The sampling programme, including measurement method, measurement results for the last 12 months, and measurement frequency. For processing and analysis methods, see Appendix 1.

O27 Emissions from HPL production

In the case of production in countries where the mandatory national requirements are less stringent than the emission levels in this requirement, it must be documented that the following emissions levels have not been exceeded.

The requirement relates to panels/cladding in which the content of HPL (High Pressure Laminate) accounts for more than 10% by weight of the panel/moulding.

The following limit values for emissions to air at the workplace may not be exceeded during production of HPL (High Pressure Laminate):

The limit value is expressed in relation to a reference period of 8 hours' time-weighted average (TWA):

- Limit value for formaldehyde cas. no. 50-00-0: 0.5 ppm or 0.6 mg/m³
- Limit value for phenol cas. no. 108-95-2: 2 ppm or 8 mg/m³

The limit value is expressed in relation to a short-term value of max. 15 min.:

- Limit value for formaldehyde cas. no. 50-00-0: 1.0 ppm or 1.2 mg/m³
- Limit value for phenol cas. no. 108-95-2: 4 ppm or 16 mg/m³

Air measurements for phenol and formaldehyde for the past 12 months, containing a description of the sampling programme, including measurement methods and measurement frequency. For analysis methods, see Appendix 1, or

Description of mandatory national regulatory requirements, showing that the requirement automatically is followed.

O28 Dust emissions

In the case of production in countries where the mandatory national requirements are less stringent than the emission levels in this requirement, it must be documented that the following dust emission levels have not been exceeded.

The following limit values for emissions to indoor air must not be exceeded during the manufacture of panels/cladding in relation to the working environment. The requirement relates to panels/cladding in which the content of mineral raw materials or wood raw materials individually accounts for more than 10% by weight of the panel/cladding:

- Mineral dust, inert: 10 mg/m³
- Mineral dust, inert, breathable: 5 mg/m³
- Mineral wool: 1 fibre/cm³
- Wood dust, breathable: 2 mg/m³
- Organic dust, total: 5 mg/m³

Dust measurements according to the requirement for the past 12 months, containing a description of the sampling programme, including measurement methods and measurement frequency. For analysis methods, see Appendix 1,

or

- ☒ Description of mandatory national regulatory requirements, showing that the requirement automatically is followed.

4 Quality, properties, and maintenance of the product

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

O29 Quality and properties of the product

For products covered by a harmonised standard, the properties and functions with which the product is marketed must be documented by a declaration of performance (DoP). As documentation, an example of CE marking and declaration of performance pursuant to the Construction Products Regulation (305/2011/EC) should be submitted.

For products that are not covered by a harmonized product standard, the panel's properties and functions may be declared by one of the following three alternatives:

1. either by a voluntary CE marking and declaration of performance in accordance with an ETA (European Technical Assessment).
2. or alternatively to an ETA, the panels properties may be declared by a relevant third-party verification of the performance of the product. In this case, this third-party verification shall be approved by Nordic Ecolabelling.
3. or for non-load bearing product, the properties can be declared with relevant standardized quality test with integrated internal factory control. In this case, the choice of test standard shall be approved by Nordic Ecolabelling.

- ☒ For products covered by a harmonised product standard, it should be stated which product standard(s) cover the product and the declaration of performance should be submitted.

- ☒ For products not covered by a harmonized standard there shall be submitted either:
 - a declaration of performance in accordance with an ETA for the Nordic ecolabelled product
 - other third-party verification of the properties and performance of the product.
 - a description of the quality standard and test results as described in the requirement.

O30 Information about the product

The manufacturer/supplier must inform the consumer about how best to use, maintain and store the product. The information must be given in the official language of the country in which the Nordic Ecolabelled product is marketed.

The product must be accompanied by written instructions, which state:

- The area of use for which the product is intended.
- How the product is to be stored on the building site.
- Assembly and instructions for any surface treatment.

- How the product is to be maintained, which maintenance products are suitable for the product (paint, oils, etc.) and how often these maintenance products must be used.

☒ Copy of information material, which accompanies the construction panel.

5 Licence maintenance

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

O31 Customer complaints

The licensee must guarantee that the quality of the Nordic Swan Ecolabelled product or service 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.

O32 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.

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-swan-ecolabel.org/regulations

Follow-up inspections

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

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

Criteria version history

Nordic Ecolabelling adopted version 1.0 of the criteria for panels and cladding for exterior use on 22 August 2023. The criteria are valid until 1 October 2025.

Appendix 1 Analysis and test laboratories

Requirements on the analysis laboratory (all)

The analysis laboratory used shall fulfil the general requirements of standard EN ISO 17025 or have official GLP status.

The applicant's analysis laboratory/test procedure may be approved for analysis and testing if:

- sampling and analysis are monitored by the authorities, or
- the manufacturer's quality assurance system covers analyses and sampling and is certified to ISO 9001 or
- 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 the manufacturer takes samples in accordance with a fixed sampling schedule.

Heavy metals (O2)

Measurement must be carried out in accordance with DS 259 Water quality investigations - Determination of metals in water, soil, sludge and sediments, DS/CEN/TS 16172 Sludge, treated biowaste and soil – Determination of elements using graphite furnace atomic absorption spectrometry (GF-AAS) or another equivalent method. The analysis must be carried out with a relevant analysis method. The most suitable analysis methods are ICP-MS (Inductively coupled plasma mass spectrometry) or FAAS (Flame atomic absorption spectrometry).

The analysis report must contain information about the sensitivity of both the analysis value and the method. Two representative samples must be taken each week and combined in a monthly sample. The monthly sample must be analysed. The measurement result must be calculated as the average result from three consecutive monthly samples analysed during the 12 months before the application was submitted.

Dust emissions (O3)

Dust measurement is performed according to the relevant standard measurement methods, e.g., SS 028426, NS 4861, 4862 and 4863, EN 13284: Stationary source emissions, EN 482 Workplace exposure - General requirements for the performance of procedures for the measurement of chemical agents or ISO 16911.

For dust from mineral wool, ISO 10397 is used: Determination of asbestos plant emissions.

COD emissions in wet processes (O8)

Analysis method: Oxygen-consuming substances must be analysed according to the international standard ISO 6060 Water quality – determination of the chemical oxygen demand. If another analysis method is used, the licence applicant must show that it is equivalent. An analysis of PCOD or BOD may also be used as verification if there is a correlation with COD. The method for measuring TOC is ISO 8245

Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC).

Sampling frequency: Emissions of oxygen-consuming substances must be calculated as an annual average and be based on at least one representative 24-hour measurement per week. Alternatively, a sampling frequency set by the authorities may also be approved.

Sampling: Water samples must be taken after the process drainage water has been treated, perhaps in an internal purification plant. The flow at the time of sampling must be indicated. If the process drainage water is purified externally along with other wastewater, the analysis results must be reduced accordingly by the documented COD efficiency at the external purification plant. The analyses must be carried out on unfiltered and un sedimented samples in accordance with standard ISO 6060.

Paper and cardboard: For campaign-produced pulp types, the requirement is that the result is based on 40 consecutive 24-hour samples. For shorter campaigns, representative 24-hour samples from each campaign are acceptable, but these must amount to at least 40 24-hour samples in total. Sample-taking must be done before an external purification plant and before mixing with other wastewater effluent. The analysis result should then be reduced by the purification plant's efficiency. The efficiency of the purification plant must be documented.

Measurement of Air quality – workplace atmospheres (O27) and (O28)

Air measurements are carried out in accordance with relevant standard test methods, including among others:

- EN 689, Air quality – Workplace atmospheres, guidance in the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy.
- EN 482, Air quality – Workplace atmospheres, general performance requirements for methods for determining the concentration of chemicals in the air.
- EN 14042, Workplace atmospheres – Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.

Air measurements of phenol and formaldehyde

Air Measurements of phenol and formaldehyde submitted for the last 12 months, with a description of the sampling program, including measurement methods and measuring frequency. Air measurement is performed both for a reference period of 8 hours' time weighted average (TWA) and a short-term value of no more than 15 minutes.

Air measurement shall be conducted as the exposure measurement, which conducted a review of each employee's exposure to pollution. For these measurements measuring equipment shall be personally carried.

When sampling for exposure measurements, thus including shall be ensured:

- the sampling is carried out under normal operating conditions with normal ventilation
- including the particularly stressful phases of different work processes
- the sampling time is so long that it shows a representative average value

- the planning of sampling carried out the identification of potential variations in concentration during the work or working.

Appendix 2 Applicant's list of materials

Applicant:	Contact:
Product:	The product's total weight in kg:

Table 1 presents a general view of the current requirements. The quantities and composition of various materials may determine the requirements that apply. Applicants must complete Tables 1 and 2. For variations within the same product type, the requirements are activated even if they are only relevant for one of the variations.

Table 1: List of materials and the sections in which the requirements are found.

Section	Level	Requirement	Appendix	Relevant Yes	Relevant No
Product information	Information about the product	O1	2	For all	For all
Mineral raw materials Applies in cases with more than 10% by weight in the product.	Mineral raw materials	O2-O3	-		
Wood raw materials, paper, cardboard, and paper pulp Applies in cases with more than 5% by weight in the product.	Wood fibres, cardboard, and pulp	O4	3		
	Solid wood, veneer, bamboo, and cork	O5-O7	4		
	Revised req. for old wood, veneer, bamboo, and cork	O6-O7	10		
	COD from paper and cardboard	O8	-		
Resources	Cement-based and mineral wool panels	O9	5		
Energy requirements	Energy requirements for paper and pulp production Applies in cases with more than 30% by weight in the product.	O10	6		
	Energy requirements for different types of panel/mouldings	O11-O14	-		
Chemical products	General	O15-O19	7		
	Nanoparticles	O20	7		
	Environmental hazard	O21	8		
	Environmental hazard in surface treatment	O22	8		
	VOC in adhesives	O23	9		
	VOC in surface treatment	O24	9		
	Free formaldehyde	O25	7		
Emissions	COD (wet processes in panel/moulding production)	O26	-		
	HPL production	O27	-		
	Dust emissions	O28	-		
Information and quality	General	O29-O30	-		
Licence maintenance	General	O31-O32	-		

Table 2 below must be used to give an overview of:

- All suppliers of materials/raw materials/chemicals contained in the product.
- The function of the material in the product (e.g., core material, fibre, adhesive or surface treatment).
- The type of material/product (e.g., pigment, binder, fibreglass, wood fibre, cardboard, etc.).
- State which materials are renewable (bio-based) and the percentage of the individual material which has been recycled, cf. definitions in Requirements O9, with specification of pre-consumer and post-consumer fractions, cf. ISO 14021.
- The product's total weight should be stated, together with the volume of the individual materials in the product, and their weight percentage of the product's total weight.
- As an alternative to Table 2, Nordic Ecolabelling also accepts complete spreadsheets or similar from the producer if the information described here is included. Table 1 above must always be completed.

Table 2: List of materials and suppliers, function within the product and material volumes.

Supplier	Function within product	Material type and composition	Percentage renewable/recycled	Weight in kg	Wt.%
1.					
2.					
3.					
4.					
5.					
6.					
7.					
Total weight					100%

Applicant's signature:

Date:	Company name:
Person responsible:	Telephone and Email:

Appendix 3 Paper, cardboard, and pulp - recycled/certified fibers

Name of the raw material:
Producer/supplier of raw materials for paper, cardboard, and pulp:

Does the paper, cardboard or pulp contain at least 70% recycled fibre?

Yes No

If the paper, cardboard, or pulp contains less than 70% by weight recycled fibre, state how much:

Does the paper, cardboard or pulp contain at least 30% by weight certified* wood fibre?

Yes No

If the paper, cardboard, or pulp contains less than 30% by weight certified wood fibre, state how much:

** Where operation has been certified under the forestry standard and certification system stated in Appendix 4c or certified as organically cultivated or where cultivation is in the process of being converted to organic production*

Appendix 4 Wood, veneer, bamboo, and cork

- 4a Origin, traceability, and certified raw materials (to be completed by wood supplier)
- 4b Description of the raw material and certified wood (to be completed by the panel manufacturer)
- 4c Requirement for forestry certification (Requirement for forestry certification)

4a Origin, traceability, and certified raw materials

(To be completed by wood supplier)

Supplier/producer of wood, veneer, bamboo, and cork:
Producer:
Product type (e.g., solid wood, plywood, or bamboo):

As documentation of the raw material, the following shall be indicated in the table below:

- Wood type/bamboo and geographical origin (country/state and region/province)
- Copy of certificate(s) for forest certification and type standard
- Proportion (%) of wood from certified forestry/raw material (copy of invoice may be used as documentation)

Type of wood/raw material (type and name)*	Geographical origin (country/state and region/province)	Forest Management (no.) Chain of Custody (no.)	Proportion (%) from certified forestry

* Describe whether the wood is pine, spruce, beech, etc. and give the Latin name.

Have any of the above wood raw materials been treated with biocide after felling? Yes No

Is the biocide classified by WHO as type 1A and/or 1B? Yes No

Signature of producer/supplier of wood, veneer, bamboo, and cork:

Date:	Company name:
Person responsible:	Telephone: Email:

4b Description of the raw material and proportion of certified raw materials

(To be completed by panel manufacturer)

For documentation of the raw material:

Detailed description of the supplier chain from cultivation (forest) to panel manufacturer:

Alternatively, a flow diagram showing the supply chain from cultivation to manufacturer may be submitted as a separate document.

Type of wood/raw material (type and name)*	Supplier	Volume (m3 per year)	Proportion (%) of wood from certified forestry
Total:			

* Describe whether the wood is pine, spruce, beech, etc. and give the Latin name.

Signature of panel manufacturer:

Date:	Company name:
Person responsible:	Telephone: Email:

4c Requirements for forest certification

Wood included in the product must be certified by a third party, cf. the applicable forestry standard which fulfils the requirement for the standard and certification system.

The following requirements apply to standards and certification systems that can be accepted by Nordic Ecolabelling.

Standards:

1. The standard must balance economic, ecological and social interests and comply with the UN's Rio document, Agenda 21, and the Forest Principles, and respect relevant international conventions and agreements.
2. The standard must include absolute requirements and promote the objective of sustainable forestry.
3. The standard must be generally available. The standard must have been developed in an open process in which ecological, economic and social stakeholders have been invited to participate.

Certification system:

The certification system must be open and have broad national or international credibility, and it must be possible to control compliance with the requirements in the forestry standard (see above).

Certification body:

The certification body must be impartial and credible and be able to verify that the requirement in the standard has been fulfilled, be able to communicate the result, and be suitable for an effective implementation of the standard.

Documentation:

Copy of the forestry standard, name, address, and telephone number of the organisation that drew up the standard, and the certification body's approval report.

References must be given for persons representing parties and interest groups that have been invited to contribute to the development of the forestry standard.

The environmental labelling organisation is entitled to require further documentation in order to assess whether the requirements in the standard and the certification system are fulfilled.

Alternatively:

In certain cases, Nordic Ecolabelling may agree to grant a licence without the wood used in production being certified in accordance with an approved forestry standard.

It must be documented in another reliable way that the wood is sourced from sustainable forestry with a level of requirements that is equivalent to the approved forestry standards.

Appendix 5 Recycled raw material

Supplier/producer of raw material:
Producer:
Type of raw material (e.g. solid mineral wood or fly ash):

How large a proportion of the raw material is recycled from the pre-consumer stage?

_____ %

How large a proportion of the raw material is recycled from the post-consumer stage?

_____ %

Post-consumer and pre-consumer are defined according to ISO 14021, as described below.

Pre-consumer material:

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

Pre-consumer material:

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

Signature of raw material producer/supplier:

Date:	Company name:
Person responsible:	Telephone: Email:

Appendix 6 Energy requirements for paper and pulp production

6a Guidelines for energy calculation

Requirements are laid down for the application of energy in the form of fuel or electricity. The starting point is information about the actual energy consumption from production compared to a documented reference value. The quotient of these values is stated as energy points.

The energy calculations cover all the paper products: both paper production and the pulp employed. In the case of paper, the calculations are performed without regard to fillers. Energy consumption for transporting the raw materials and for conversion and packing are not included in the energy calculation.

Applied energy:

State the total energy consumption for the paper or pulp production processes per tonne of product, broken down into fuel and electricity.

Fuel:

With regard to fuel, bought-in fuel, internally produced fuel and residual products should all be stated. This means, for example, that lye, bark, and wood chips must be included to the extent that their heating values contribute to energy supplies for the process. Fuel used both for heat production and internal electricity production must be stated. Fuel consumption is calculated from the effective heating value of the dry substance. The calculations may derive from internally measured heating values or values according to Appendix 6d. If the fuel is damp, the calculation method in appendix 6e may be used.

As fuel can also be used for electricity production internally, in such cases corresponding amounts of fuel must be subtracted from the actual fuel consumption ($=1.25 \cdot$ internally produced electricity). This will avoid the double counting of energy information for fuel used for internal electricity production.

Electricity:

Both bought-in and internally produced electricity must be included in the calculations.

- ☒ The calculation of electricity and fuel consumption must be based on invoices and readings from in-house electricity meters. The calculated points level must then be forwarded by the pulp producer to the paper producer and to Nordic Ecolabelling. The paper producer can then carry out a calculation of the total energy points for the finished paper. The calculation includes the energy points for all pulps used and energy points for paper production.

- ☒ Internally produced electricity can be documented by readings from in-house electricity meters. In the case of bought-in fuel, the amount purchased must be reconciled with the amounts at the start and end of the year in question. Internal consumption of residual products such as lye, bark, wood chips, etc. is calculated from the estimated heating values of the fuels used (see Table 6.3 in Chapter 6d). Hence, the total consumption of electricity and fuel is reported.

Steam:

If surplus 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, the steam table in Appendix 6d 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 2.5.

Integrated production:

The energy reference values for both paper production and pulp production must be used for integrated production (Tables under 6.1 and 6.2). For integrated enterprises which act both as suppliers of market pulp and pumped pulp for ecolabelled products, the reference value for drying the market pulp must be used for the market pulp but not for the pumped pulp.

Energy surplus:

Energy surpluses sold in the form of electricity, steam or heat should be subtracted from the total consumption. The amount of fuel used for producing sold-on electricity or heat is calculated by dividing the sold electricity or heat by 0.8. This corresponds to an average efficiency for the total production of electricity and heat.

Alternatively, the actual efficiency of the plant for converting fuel to heat energy may be used if this can be documented to Nordic Ecolabelling.

6b Energy calculation, paper manufacturer

Energy points for paper production

The energy points $P_p(\text{electricity})$ and $P_p(\text{fuel})$ for paper manufacture on the paper machine are calculated by the following formulae:

$$P_{p(\text{electricity})} = \text{Electricity}_{\text{used}} / \text{Electricity}_{\text{reference}}$$

And

$$P_{p(\text{fuel})} = (\text{Fuel}_{\text{used}} - 1.25 * \text{hause generated electricity}) / \text{Fuels}_{\text{reference}}$$

The values for $\text{Electricity}_{\text{reference}}$ and $\text{Fuel}_{\text{reference}}$ are taken from table below.

Processes	Fuel kWh/t Reference value	Electricity kWh/t Reference value
FBB* (folding box board)/ SBS* (solid bleached sulphate)/ SBB* (solid bleached board) SUB* (solid unbleached board) WLC* (white lined chipboard)	1700	800
News	1700	750
LWC	1700	800
SC	1700	750
Uncoated fine paper	1700	750
Coated fine paper	1700	800

* Only one of the marked processes must be used

- Calculation of points by means of a calculation spreadsheet designed by Nordic Ecolabelling.

Energy points for a mixture of different pulp types

For a mixture of different pulp types, the following formulae are used for calculating the energy points, $P_{m(\text{electricity})}$ and $P_{m(\text{fuel})}$:

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

And

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

in which m_i is the proportion of the individual pulp in the total pulp mix, i.e. tonnes of individual pulp used per tonne of pulp. Due to wastage and differences in water content, the total of m_i may be greater than 1. $P_{m(\text{electricity})_i}$ is the energy points for electricity for pulp number i , and $P_{m(\text{fuel})_i}$ is the energy points for fuel for pulp number i .

- Calculation of points by means of a calculation spreadsheet designed by Nordic Ecolabelling.

Total energy points for paper and pulp production

The total points for both electricity and fuel consumption are calculated from the pulp and paper consumption points by weighting the reference values (X= weighting of reference value of pulp or paper production):

$$P_{el} = X_{El,m} * P_{El,m} + X_{El,p} * P_{El,p}$$

Where

$$X_{el,m} = (El_{reference,m} / (El_{reference,m} + El_{reference,p}))$$

$$X_{el,p} = (El_{reference,p} / (El_{reference,m} + El_{reference,p}))$$

$$P_{fuel} = X_{Fuel,m} * P_{fuel,m} + X_{fuel,p} * P_{fuel,p}$$

Where

$$X_{fuel,m} = (Fuel_{reference,m} / (Fuel_{reference,m} + Fuel_{reference,p}))$$

$$X_{fuel,p} = (Fuel_{reference,p} / (Fuel_{reference,m} + Fuel_{reference,p}))$$

For a mixture of pulps, the reference values for electricity and fuel must be weighted by the proportion of pulp, m_i , in the expressions for X.

- ☒ The calculation of points with part results must be shown in the documentation. It must be clearly stated what starting values were applied for use of fuel and electricity. A calculation spreadsheet designed by Nordic Ecolabelling must be used for the calculation.

6c Energy calculation, pulp manufacturer

The energy points $P_{\text{electricity}, mi}$ and $P_{\text{fuel}, mi}$ for production of a pulp i should be calculated according to the formulae below:

$$P_{m(\text{electricity})} = \text{Electricity}_{\text{used}} / \text{Electricity}_{\text{reference}}$$

And

$$P_{m(\text{fuel})} = (\text{Fuel}_{\text{used}} - 1.25 * \text{hause generated electricity}) / \text{Fuels}_{\text{reference}}$$

The values for $\text{Electricity}_{\text{reference}}$ and $\text{Fuel}_{\text{reference}}$ are taken from table below.

Processes	Fuel kWh/t Reference value	Electricity kWh/t Reference value
Bleached chemical pulp	3750	750
Dried, bleached chemical pulp	4750	750
Unbleached chemical pulp	3200	550
Dried, bleached chemical pulp	4500	550
CTMP	n.a.	2000
Dried CTMP	1000	2000
DIP	350	500
Dried DIP	1350	600
TMP	n.a.	2200
Dried TMP	1000	2200
Slip	n.a.	2000
Dried slip	1000	2000

- ☒ Calculation of points by means of a calculation spreadsheet designed by Nordic Ecolabelling.

6d Heating value and steam table

Fuel	Heating value (lower)	Unit
Wood briquettes	10.0	GJ/m3 loose
Wood pellets	10.0	GJ/m3 loose
Wood powder	3.80	GJ/m3 loose
Wood chips	3.55	GJ/m3 loose
Saw dust	2.90	GJ/m3 loose
Bark	2.22	GJ/m3 loose
Lump peat	4.50	GJ/m3 loose
Milled peat	3.75	GJ/m3 loose
Sulphate lye	12.7	GJ/kg DS
Sulphite lye	14.7	GJ/kg DS
Tall oil pitch	36.8	GJ/m3
Natural gas	38.9	MJ/m3
Light fuel oil	36.0	GJ/m3
Heavy fuel oil	38.7	GJ/m3
LPG	46.1	MJ/kg
Coal	26.5	MJ/kg

Steam table

Enthalpy of measured steam, h'' as a function of absolute pressure, p or temperature, t . The enthalpy is divided by an efficiency rate 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	2717.5	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, referencing Schmidt, E.: Properties of water and steam in SI Units, 1969. Springer- Verlag and R. Oldenbourg 1969.

1. All values are given in tonnes except for natural gas, where they are given in kg per normal cubic metre (kg/Nm³).
2. Natural gas in kg/Nm³.

Sources: Statistics Sweden: Energy statistics 1995. SFT (Norwegian Environment Agency) Report 9513; Incineration plants. Guidance for project managers. SFT (Norwegian Environment Agency): Emission coefficients (Audun Rosland, 1997).

6e Energy content of damp fuel

Calculation of energy content of damp fuel

The effective heating value of damp fuel can be calculated with the following formula:

$$Q_{iw} = Q_{ik} * (100 - w)/100 - 2.45 * w/100,$$

where

Q_{iw} = lower heating value of damp fuel expressed in kJ/kg

Q_{ik} = lower heating value of dry substance expressed in kJ/kg

w = water content of damp fuel expressed as water percentage.

Calculation of energy content of wood chips

The energy content of wood chips depends primarily on the water content. The following explains how this can be calculated.

The energy content (lower heating value) of dry wood is stated as 19 MJ/kg.

Energy is required for evaporating the water normally present in wood. This energy demand reduces the wood's heating value. The formula for calculating the relationship between the energy content and the water content can be formulated as follows:

$$19 \text{ MJ} * (100 - \text{water \%})/100 - 2.45 * \text{water \%}/100 = \text{xx MJ/kg}$$

It is necessary for the water content of the wood to be known.

Immediately after the tree is felled, the water content can be up to 55%. The water slowly evaporates from the wood, first during transport and then when it is cut up and seasoned for use in pulp production etc. During this period, the water content depends on the precipitation during the period. Normally, it will reduce to 20-40%.

For a 40% water content, the energy content can be calculated as:

$$19 \text{ MJ} * (100 - 40\%)/100 - 2.45 * 40/100 = 10.4 \text{ MJ/kg}$$

For a 20% water content, the energy content can be calculated as:

$$J * (100 - 20\%)/100 - 2.45 * 20/100 = 14.7 \text{ MJ/kg}$$

Appendix 7 Chemical products - generally

The chemical product's name and area of use:
Producer/importer of the chemical product:

Conditions for declaration

The following definition must be used for "ingoing": Unless otherwise stated, ingoing substance covers all substances in the product, including additives to the raw materials (e.g., preservatives or stabiliser), but not impurities from production, incl. raw material production. Impurities are taken to be residues from production, incl. raw material production included in the product in concentrations of less than 100 ppm (0.0100% by weight, 100 mg/kg), but not substances added to a raw material or product deliberately and for a purpose, regardless of the quantity. Impurities must also be stated in the declaration. Known cleavage products of ingoing substances are also considered to be constituents.

This appendix is completed and signed by the chemical supplier based to the best of his/her knowledge at the time of the application, also based on information from raw material manufacturers, recipe, and available knowledge on the chemical product with reservations for new advances and new knowledge. Should such new knowledge arise, the undersigned is obliged to submit an updated declaration to Nordic Ecolabelling. If the information concerning the composition of the raw materials is confidential, the information can be sent directly to the environmental labelling organisation.

Classification of chemical products in and/or on the panel/moulding (e.g., adhesive, paint, coatings, etc.)

Is the chemical product classified in accordance with the table below?

Yes No

If yes, state the classification: _____

CLP Regulation 1272/2008		EU Dangerous Substance Directive 67/548/EC	
Signal words	Hazard statement	Indication of danger	Risk phrase
Danger, Carc. 1A or 1B Danger, Carc. 1A or 1B Warning, Carc. 2	H350 H350i H351	Carcinogenic T T Xn	R45 and/or R49 R40
Danger, Muta. 1A or 1B Warning, Muta. 2	H340 H341	Mutagenic T Xn	R46 R68
Danger, Repr. 1A or 1B Danger, Repr. 1A or 1B Warning, Repr. 2 Warning, Repr. 2 - -	H360 H360 H361 H361 H362 H362	Reprotoxic T T Xn Xn - -	R60 R61 R62 and/or R63 R33 R64

Danger, Acute Tox. 1 or 2 Danger, Acute Tox. 1 Danger, Acute Tox. 2 Danger, STOT SE 1	H330 H310 H300 H370	Very toxic Tx Tx Tx Tx	R26 R27 R28 and/or R39
Danger, Acute Tox. 2 or 3 Danger, Acute Tox. 3 Danger, Acute Tox. 3 Danger, STOT SE 1 Danger, STOT RE 1	H330 or H331 H331 H301 H370 H372	Toxic T T T T T	R23 R24 R25 R39 and/or R48

Classification of constituent substances

Are the constituent substances of the chemical product classified in accordance with the table below? Yes No

If yes, state which substances, which classification, and the amount:

CLP Regulation 1272/2008:		EU Dangerous Substance Directive 67/548/EC	
Signal words	Hazard statement	Indication of danger	Risk phrase
Danger, Carc. 1A or 1B Danger, Carc. 1A or 1B	H350 H350i	Carcinogenic T T	R45 and/or R49
Danger, Muta. 1A or 1B	H340	Mutagenic T	R46
Danger, Repr. 1A or 1B Danger, Repr. 1A or 1B	H360 H360	Reprotoxic T T	R60 R61

Content and additives in the chemical product

Does the chemical product contain halogenated organic compounds? Yes No

If yes, state which substances and the amount (% by weight):

Does the chemical product contain bisphenol A? Yes No

If yes, state the amount (% by weight):

Does the chemical product contain alkylphenols, alkylphenol ethoxylates or other alkylphenol derivatives? Yes No

If yes, state which substances and the amount (% by weight):

Does the chemical product contain phthalates? Yes No

If yes, state which substances and the amount (% by weight):

Does the chemical product contain aziridine and polyaziridines? Yes No

If yes, state which substances and the amount (% by weight):

Does the chemical product contain pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds? Yes No

If yes, state which substances and the amount (% by weight):

Does the chemical product contain substances from the EU Candidate list in accordance with REACH 1907/2006/EC Article 59, Par. 10? Yes No

If yes, state which substances and the amount (% by weight):

Does the chemical product contain PBT and vPvB substances, cf. definition in REACH Regulation Annex XIII? Yes No

If yes, state which substances and the amount (% by weight):

Exemption applies to melamine CAS nr. 108-78-1)

Does the chemical product contain free formaldehyde? Yes No

If yes, state the amount in % by weight (for adhesives mixed with hardener, state the amount of the final mixture):

Nanoparticles (from nanomaterial*)

Exemptions from the requirement are granted for the following:

- Pigment**
- Synthetic amorphous silicate***
- Naturally occurring inorganic fillers****
- Polymer dispersions

Does the chemical product contain nanoparticles? Yes No

* The definition of nanomaterials follows the EU Commission's definition of nanomaterials of 18 October 2011: "Nanomaterials": a natural, incidental, or manufactured material containing particles in an unbound state or as an aggregate or an

agglomerate and where at least 50% of the particles in the size distribution by number, in one or more external dimensions, are in the size range of 1-100 nm.

*** Nano titanium dioxide is not considered to be a pigment and is therefore a subject to the requirement.*

**** This applies to conventional synthetic amorphous silicate.*

Chemically modified colloidal silica can be included if the silica particles form aggregates in the finished product. Any surface treatment must meet the chemical requirements of the criteria.

***** This applies to fillers covered by Annex V Point 7 of REACH.*

Biocides/preservatives in the chemical product

Is the product used for disinfectant or antibacterial treatment? Yes No

Does the chemical product contain preservatives? Yes No

If yes, state which substances and the amount (% by weight):

Isothiazolinone compounds

Does the chemical product contain isothiazolinone compounds? Yes No

If yes, state the content below:

The chemical product contains _____ ppm of the mixture of 5-chloro-2-methyl-2H-isothiazolin-3-one (CAS no.: 26172-55-4) and 2-methyl-2H-isothiazolin-3-one (CAS no.: 2682-20-4) (3:1).

The chemical product contains _____ ppm of 2-Methyl-3(2H)-isothiazolone.

The chemical product contains _____ ppm of other isothiazolinone compounds.

Classification of chemical products which are environmentally hazardous

Is the chemical product classified in accordance with the table below? Yes No

Hazard class	Hazard code and hazard statement according to CLP Regulation 1272/2008	Indication of danger and R-phrase according to EU Dangerous Substances Directive (67/548/EC)
Hazardous for aquatic life	Chronic 1 with H410	N; R50-53
	Chronic 2 with H411	N; R51-53
	Chronic 3 with H412	R52-53

Signature of producer of the chemical product:

Date:	Company name:
Person responsible:	Telephone: Email:

Appendix 9 Declaration of VOC content of adhesive or product for surface treatment

The chemical product's name and area of use:
Producer/supplier of the chemical product:

Conditions for declaration

The following definition must be used for "ingoing": Unless otherwise stated, ingoing substance covers all substances in the product, including additives to the raw materials (e.g., preservatives or stabiliser), but not impurities from production, incl. raw material production. Impurities are taken to be residues from production incl. raw material production included in the end product in concentrations of less than 100 ppm (0.0100% by weight, 100 mg/kg), but not substances added to a raw material or product deliberately and for a purpose, regardless of the quantity. Impurities must also be stated in the declaration. Known cleavage products of ingoing substances are also considered to be constituents.

This appendix is completed and signed by the chemical supplier based to the best of his/her knowledge at the time of the application, also based on information from raw material manufacturers, recipe, and available knowledge on the chemical product with reservations for new advances and new knowledge. Should such new knowledge arise, the undersigned is obliged to submit an updated declaration to Nordic Ecolabelling. If the information concerning the composition of the raw materials is confidential, the information can be sent directly to the environmental labelling organisation.

Does the product contain volatile organic compounds¹? Yes No

If yes, state which substances and the amount (% by weight):

Does the product contain volatile aromatic compounds (VAH)²? Yes No

If yes, state which substances and the amount (% by weight):

Signature of producer of the chemical product:

Date:	Company name:
Person responsible:	Telephone: Email:

¹ Volatile organic compound is here defined as: Organic compounds with a steam pressure exceeding 0.01kPa, at 20°C. For products under EU Directive (2004/42/EC) in which steam pressure is not indicated:

Organic substances with an initial boiling point that is lower than or equal to 250°C measured at a normal pressure of 101.3 kPa.

² Volatile aromatic compounds are volatile organic compounds in which one or several benzene rings are included in the molecule.

Appendix 10 Revised requirements for solid wood, veneer, bamboo, and cork

A) Tree species not permitted or with restricted use in Nordic Swan Ecolabelled panels/mouldings

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

- a) CITES (Appendices I, II and III)
- b) IUCN red list, categorized as CR, EN and VU
- c) Rainforest Foundation Norway's tree list
- d) Siberian larch (originated in forests outside the EU)

Tree species listed on a) CITES (Appendices I, II and III) are not permitted to be used.

Tree species listed on either b), c) or d) may be used if it meets all the following requirements:

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

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

- Declaration from the applicant/manufacture/supplier that tree species listed on a-d) are not used, or

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

- The applicant/manufacture/supplier are required to present a valid FSC/PEFC Chain of Custody certificate that covers the specific tree species and demonstrate that the tree is controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.
- The applicant/manufacture/supplier are required to document full traceability back to the forest/certified forest unit thereby demonstrating that:
- the tree does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU;
 - the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 <http://www.intactforests.org/world.webmap.html>;

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

Nordic Ecolabelling may request further information if in doubt about specific tree species.

B) Wood raw material

The applicant must state the name (species name) of the wood raw material used in the Nordic Swan Ecolabelled panels/mouldings.

Chain of Custody certification

The supplier of wood raw materials must be Chain of Custody certified by the FSC/PEFC schemes.

Applicant producer using only recycled material in the Nordic Swan Ecolabelled panels, are exempted from the requirement for traceability certification.

*Definition of recycled material, see below *.*

Certified wood raw material

A minimum of 70% by weight of all raw material (virgin/recycled material) used in the Nordic Swan Ecolabelled panels, must origin from forestry certified under the FSC or PEFC schemes or be recycled material*.

The remaining proportion of wood raw material must be covered by the FSC/PEFC control schemes regarding FSC controlled wood/PEFC controlled sources or be recycled material.

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

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

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

Nordic Ecolabelling considers products from primary wood processing industries (sawdust, wood chips, etc.) or residues from forestry (branches, etc.) as recycled material.

- Name (species name) on the wood raw material used in the Nordic Swan Ecolabelled panels.
- Supplier of wood must present a valid FSC/PEFC Chain of Custody certificate covering all wood raw material used in the Nordic Swan Ecolabelled panels.
- Documentation showing that the quantity of certified wood raw material or recycled material is met.