

# About Nordic Swan Ecolabelled **New buildings**

Residential, educational and office buildings



Version 4.0 • 15 February 2023 – 15 May 2026 (Office buildings)

• 15 May 2023 – 15 May 2026 (All other building types)

# Content

1	Summary .....	4
2	Definitions .....	4
3	Environmental impact of New buildings .....	6
3.1	RPS Analysis for New buildings .....	6
3.2	UN's Sustainable Development Goals .....	7
3.3	Alignment with the EU Taxonomy framework .....	7
4	Justification of the requirements.....	15
5	What is subject to the requirements? .....	15
6	General requirements .....	17
7	Energy and climate .....	19
7.1	Energy .....	19
7.2	Climate .....	29
8	Resource efficiency and circular economy .....	48
9	Chemical products, construction products, construction goods and materials ..	58
9.1	Product information and logbook.....	59
9.2	Chemical products .....	60
9.3	Construction products – restricted material .....	68
9.4	Construction products – ingoing substances and emissions.....	75
9.5	Ecolabelled products.....	80
10	Biodiversity and wood raw materials .....	82
11	Indoor environment.....	93
12	Innovation and other green initiatives.....	101
13	Quality management of the construction process.....	103
14	Changes compared to previous generation.....	109

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This document is the original. In case of dispute, the original document should be taken as authoritative.

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## Addresses

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

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# 1 Summary

During 2020-2022 the criteria New Buildings (previously small houses, apartment buildings and pre-school) have been revised. As from this revision, office buildings can also be Nordic Swan Ecolabelled. Holidays homes are removed from the criteria.

The main focus areas have been climate, circular economy and biodiversity where large changes have been implemented compared to generation 3. The number of obligatory points is changed from 41 to 42. The number of point-score requirements have been increased from 14 to 23. Several completely new point-score requirements have been added, especially in the sections climate and circular economy.

The most important changes as a consequence of the revision are presented below:

- A new section on climate, including requirements for a climate calculation for the building, climate adaptation and requirements for materials with high climate impact such as concrete, steel and aluminium.
- A new section on circular economy that includes new areas such as Design for Disassembly and adaptability, producer take-back systems and increased focus of handling of construction waste preparation for reuse, recycling, and material recovery.
- A new section on biodiversity that includes mandatory requirements for biodiversity that verifies the current state of the building plot in order to preserve and improve the biodiversity.
- A mandatory level for the use of Ecolabelled products and materials.
- Office buildings are now covered by the criteria.

# 2 Definitions

Definition	Description
Chemical products	A chemical product is a substance or a mixture of two or more substances, in liquid, gaseous or solid form, which are used on a construction site or by a manufacturer of prefabricated building components. Chemical products both for indoor and outdoor use are covered by the requirements. Nordic Ecolabelling does not set chemical requirements for cement or concrete, nor for metal alloys such as steel or brass.
Construction products	Products used in the construction of buildings, for example wall elements, flooring, power cables, doors, thermal insulation etc. In EU regulation No 305/2011, a construction product is defined as "any product or kit which is produced and placed on the market for incorporation in a permanent manner in construction works or parts thereof and the performance of which has an effect on the performance of the construction works with respect to the basic requirements for construction works".
EPD	A product specific EPD according to the standard ISO 14025 and EN 15804 is a third-party verified document based on product category rules (PCR) and life cycle assessment (LCA). A daughter EPD is based on a third-party verified EPD, but can be adapted to small variations in the composition of the product.

EU Taxonomy	In these criteria, references to the "EU Taxonomy" means the Delegated Act on the objective climate change mitigation (Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021). Specifically, reference is made to the activity 7.1 "Construction of new buildings".
Facade	The principal front of a building, that faces on to a street or open space.
Heavy current cables	Heavy current cables/Electricity cables for nominal voltage equivalent to or more than 50 V AC voltage or 120 V DC voltage. This means that the requirement includes electricity wires/cables for plugs and for apparatus such as fittings with 230 V, white goods, heat pumps, etc.
Homes for persons with disabilities	In order to be covered by the criteria for New buildings, the building must be classified as a residential building in the national building legislation. Shared areas for the home's residents and staff areas are also covered by the Nordic Swan Ecolabel and must fulfil the requirements.
Homes for the elderly	In order to be covered by the criteria for New buildings, the building must be classified as a residential building in the national building legislation. Shared areas for the home's residents and staff areas are also covered by the Nordic Swan Ecolabel and must fulfil the requirements.
Impurities in chemical products	Residuals, pollutants, contaminants etc. from production, incl. production of raw materials that remain in the raw material/ingredient and/or in the chemical product in concentrations of less than 1000 ppm (0.100 w-%, 1000 mg/kg) in the chemical product. Examples of impurities are residues of the following: Residues or reagents incl. residues of monomers, catalysts, by-products, scavengers, and detergents for production equipment and carry-over from other or previous production lines.
Ingoing substances	Chemical products: All substances in the chemical product, including additives (e.g., preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g., formaldehyde, arylamine, in situ-generated preservatives) are also regarded as ingoing substances.  Construction products: All substances in the construction product that are present in concentrations higher than 100 ppm (0.010 w-%, 100 mg/kg).
Nanomaterial	Nanomaterials/-particles are defined according to the EU Commission Recommendation on the Definition of Nanomaterial (2022/C 229/01): 'Nanomaterial' means a natural, incidental or manufactured material consisting of solid particles that are present, either on their own or as identifiable constituent particles in aggregates or agglomerates, and where 50% or more of these particles in the number-based size distribution fulfil at least one of the following conditions: (a) one or more external dimensions of the particle are in the size range 1 nm to 100 nm; (b) the particle has an elongated shape, such as a rod, fibre or tube, where two external dimensions are smaller than 1 nm and the other dimension is larger than 100 nm; (c) the particle has a plate-like shape, where one external dimension is smaller than 1 nm and the other dimensions are larger than 100 nm.
Post-consumer/commercial recycled material	"Post-consumer" is defined as material generated by households or commercial, industrial or institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose. This includes materials from the distribution chain.
Pre-consumer/commercial recycled material	Material that is reclaimed from the waste stream during a manufacturing process. Production waste (scrap, rework, regrind) that can be returned directly to the same process in which it was generated is not counted as recycled pre-consumer material. Nordic Ecolabelling defines rework, regrind or scrap, that cannot be reused directly in the same process, but requires reprocessing (e.g., sorting, reclamation and granulation) before it can be reused, to be pre-consumer material. This is regardless of whether it is produced in-house or externally.
Recycled material	Recycled material is defined according to ISO14021 in the categories of pre-consumer and post-consumer and includes both mechanical and chemical recycling.
Reused materials	Reuse of a material means using it again for the same purpose for which it was originally made. The original product is usually not altered in any significant way before being used again.  These criteria also include use of a certain material again, but in a manner different to what it was originally intended for. The original product is left mostly intact, utilising its shape, form and material for a different purpose.
Supplementary buildings	Supplementary buildings are refuse depots, bicycle sheds, garages (both as a separate structure or connected to the building) and similar constructions.

Take back systems	An initiative organized by the manufacturer or retailer, to collect used products or materials from the construction sites and module manufacturers and reintroduce them to the original processing and manufacturing cycle. A company may implement this program in collaboration with end-of-life logistics and material processing firms.
Technical service areas	Technical service areas are fan rooms, substations, lift shafts, machine rooms, electrical rooms, and other areas to which unauthorised persons do not have access. The following are not service areas: all living areas and communal areas such as dressing rooms, shower rooms, stairways, entrance areas, storerooms, corridors in basements/galleries, pram rooms and bicycle rooms. Installation shafts.

### 3 Environmental impact of New buildings

The criteria for Nordic Swan Ecolabel New buildings are based on the principles of life cycle assessment and RPS (Relevance, Potential and Steerability) analysis. The following table sums up the overall output of the RPS analysis, which aims to maximise the total environmental benefit of the criteria.

#### 3.1 RPS Analysis for New buildings

Area	RPS level (high-medium-low)	Comment
<b>Climate impact</b>	R= High P= High S= Medium	The Nordic Swan Ecolabel contributes to reduced climate gas emissions through different pathways: reduced energy use, specific climate requirements for materials with high climate impact (cement, steel and aluminium), transition from fossil to sustainable energy, renewable raw materials and reduced waste. Furthermore, Nordic Ecolabel sets a requirement to produce a climate calculation for the building, leading to increased attention to the critical parts of materials and constructions in relation to the climate footprint.
<b>Circular economy</b>	R= High P= High S= Medium	The construction sector produces a large amount of construction waste and consumes a lot of resources. When possible, materials should stay in closed loops and be reused or recycled into new construction products instead of ending up as waste. The Nordic Ecolabel focuses on setting requirements so that virgin materials of today can be reused or recycled in the future. This is ensured, for instance, through strict chemicals requirements that minimise harmful substances in construction materials and waste. Furthermore, requirements are set in order to increase the demand for secondary materials in the current market
<b>Building's energy demand</b>	R= High P= High S= Medium	From a life cycle perspective, the user phase of the building is critical in relation to the building's total energy demand. The Nordic Ecolabel sets strict requirements to lower the energy demand of the building across its entire lifetime.
<b>Chemical products and construction products</b>	R= High P= High S= Medium	Chemicals that are hazardous to health and the environment are found in many construction products and chemical products. In many cases, environmentally friendly alternatives are available, where the content of hazardous substances has been limited or completely phased out. Through its requirements for chemical content in materials and products, Nordic Ecolabelling contributes to the use of chemicals that are less damaging to health and the environment.
<b>Indoor environment</b>	R= High P= Medium S= Medium	We spend a large part of our time in our homes and educational buildings. A Nordic Swan Ecolabel building contributes to a good indoor environment and good health. Identified indoor environmental factors that are critical for achieving a good indoor environment are: acoustics, daylight and moisture prevention control and radon.
<b>Biodiversity</b>	R = High P= medium S= medium	Nordic Ecolabel aims to protect and preserve the existing biodiversity at the construction site. Where possible, measures are taken to improve biodiversity in relation to the construction projects.

## 3.2 UN's Sustainable Development Goals

The UN Sustainable Development Goals (SDGs, Global Goals) are a universal call to action to fight poverty and inequalities, protect the planet and tackle climate change by 2030. The Nordic Swan Ecolabel contributes to Goal 12, "Ensure sustainable consumption and production patterns". The criteria for New Buildings contribute to Goal 12 as follows:

- Having requirements for reduced climate impact of the building and regulation of specific materials with a high impact on the climate, such as concrete/cement, aluminium, and steel.
- Promoting the principles of a circular economy by increasing the demand for recycled products, demanding a logbook/building passport, ensuring comprehensive sorting of construction waste and implementing the principles of design for disassembly.
- Having restrictions on chemical substances that are harmful to health and the environment, including construction products, materials and chemical products. Thereby ensuring a healthy indoor environment, reducing the spread of substances of concern and promoting the potential for material reuse in the future.
- Setting strict requirements for low energy consumption in the final building, automatic control of outdoor lighting and energy efficient white goods.
- Having requirements for certified, sustainable wood raw materials and traceability.
- In the construction process, maintaining a focus on quality and on the correct handling and installation of materials in the building to ensure that the resources are used optimally.

## 3.3 Alignment with the EU Taxonomy framework

### Disclaimer

There are many uncertainties on how EU Taxonomy compliance can be documented as well as the interpretation. Therefore, Nordic Ecolabelling cannot guarantee EU taxonomy alignment through our criteria for New Buildings.

Nordic Swan Ecolabel do not take any legal responsibility for the (degree of) alignment, nor can a building project or a building material ecolabelled with NSE (or listed in the SCDP) be claimed as taxonomy aligned based on the ecolabelling criteria.

The responsibility for documentation of EU taxonomy compliance solely belongs to the company who is claiming it.

This section describes how the Delegated Act on the objective climate change mitigation (Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021) is handled in these criteria for New Buildings. Specifically, reference is made to the activity 7.1 "Construction of new buildings". From here on it will be referred to as "the EU Taxonomy".

The following two tables display how Nordic Ecolabelling assume how the EU Taxonomy can be interpreted in relation the criteria for New Buildings. This assessment is done to the best of our knowledge and no responsibility is taken on these interpretations.

Nordic Ecolabelling closely follow interpretations of the EU Taxonomy criteria in both the Nordic countries and from EU. In the end the interpretation is a task for national authorities or other officially appointed bodies.

### Implementation strategy

The overall implementation strategy for Nordic Ecolabelling is to:

- Implement the technical screening criteria for significant contribution to climate change mitigation as mandatory requirements in this Nordic Swan Ecolabelling criteria generation 4 in all countries where it is feasible.
- Implement those Do-No-significant-harm criteria in generation 4, that are considered relevant and reasonable, and where the delegated act is relatively clear on what is required to fulfil the requirement.
- Social minimum guarantees as defined in the EU Taxonomy are not evaluated or covered by these criteria.
- In generation 5 of the criteria (next generation) Nordic Ecolabel aims to become a tool for documentation of alignment with The EU Taxonomy Climate change mitigation.

The Technical screening criteria are according to the internal assessment done by Nordic Ecolabelling assumed to be handled in the following way (please note the disclaimer in the beginning of this section):

Technical screening criteria in the EU Taxonomy	Nordic Ecolabelling evaluation of the screening criteria compared to the Nordic Swan Ecolabel criteria for New buildings generation 4
<p><b>7.1.1: Primary energy demand</b></p> <p>The Primary Energy Demand (PED) <sup>(281)</sup>, defining the energy performance of the building resulting from the construction, is at least 10% lower than the threshold set for the nearly zero-energy building (NZEB) requirements in national measures implementing Directive 2010/31/EU of the European Parliament and of the Council <sup>(282)</sup>. The energy performance is certified using an as built Energy Performance Certificate (EPC).</p> <p><sup>(281)</sup> The calculated amount of energy needed to meet the energy demand associated with the typical uses of a building expressed by a numeric indicator of total primary energy use in kWh/m<sup>2</sup> per year and based on the relevant national calculation methodology and as displayed on the Energy Performance Certificate (EPC).</p> <p><sup>(282)</sup> Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (OJ L 153, 18.6.2010, p. 13).</p>	<p>The primary energy demand of the building is restricted in requirement "O3 Energy demand of the building". See national details below.</p> <p>Finland, Sweden and Denmark: have implemented Directive 2010/31/EU and defined the threshold limits in the national building legislation to be in accordance with NZEB. The threshold limits for the building's energy demand defined in O3 in these criteria are all minimum 10% better than the national building legislation for all building types covered by this requirement.</p> <p>According to the Draft commission notice 2022-12-19 on the EU Taxonomy climate delegated act question nr. 115 compliance must be verified by an Energy Performance Certificate after completion of construction. This is implemented in O3.</p> <p>Norway has not implemented Directive 2010/31/EU, but a guidance on how to calculate primary energy demand and energy threshold limits for NZEB was published by the Ministry of Local Government and Regional Development on 31 January 2023. The threshold limits are defined as delivered energy. Since all primary energy factors should be set to 1 according to the</p>



	<p>guidance, the threshold limits for delivered energy and the threshold limits for net energy demand in O3 can be compared directly. The threshold limits for the building's energy demand in O3 in these criteria corresponds to levels that are between 11 % (school building) and 33 % (small house of 170 m<sup>2</sup>) lower than the threshold limit set for NZEB for the relevant building types, when energy for technical equipment is subtracted for all building types, and in addition energy use for lighting is subtracted for small houses and apartment buildings. This means that the taxonomy requirement of at least 10 % lower than NZEB is fulfilled for all relevant building types. However, separate energy calculations must be conducted for buildings to document alignment with the taxonomy since the guidance refers to delivered energy and O3 refers to net energy demand.</p> <p>Iceland: has not implemented Directive 2010/31/EU and have therefore not defined the threshold limits in the national building legislation in accordance with NZEB. Nordic Ecolabelling awaits the national authorities before any conclusions can be made.</p> <p>In conclusion, it is assessed that the documentation required to verify O3 for DK, FI, NO and SE can be used as documentation to verify taxonomy compliance. Calculation methods and documentation can be seen in O3.</p>
<p><b>7.1.1.2: Air tightness</b> For buildings larger than 5 000 m<sup>2</sup> <sup>(283)</sup>, upon completion, the building resulting from the construction undergoes testing for airtightness and thermal integrity <sup>(284)</sup>, and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. As an alternative, where robust and traceable quality control processes are in place during the construction process this is acceptable as an alternative to thermal integrity testing.</p> <p><sup>(283)</sup> For residential buildings, the testing is made for a representative set of dwelling/apartment types.</p> <p><sup>(284)</sup> The testing is carried out in accordance with EN13187 (Thermal Performance of Buildings - Qualitative Detection of Thermal Irregularities in Building Envelopes - Infrared Method) and EN 13829 (Thermal performance of buildings. Determination of air permeability of buildings. Fan pressurisation method) or equivalent standards accepted by the respective building control body where the building is located.</p>	<p>The airtightness of the building is covered by the requirement "O38 Air permeability".</p> <p>In the Nordic Swan Ecolabel criteria, the applicant must have routines to test air permeability/airtightness based on the standard EN ISO 9972 or alternative method referred to in national building legislation in order to ensure the performance that is set at the design stage. To our knowledge the standard EN ISO 9972 has replaced EN 13187.</p> <p>The routines must include defect analysis and corrective measures in cases where the projected air permeability is not achieved. The tests and follow-up based on the routines must be documented in requirement "O42 the contractor's self-monitoring system".</p> <p>According to the Draft commission notice 2022-12-19 on the EU Taxonomy climate delegated act question nr.nr 116 it is assessed that by requiring a traceable and robust quality system in O42 the contractors self-monitoring system, it is not necessary to perform thermal integrity testing if the construction is certified. Nordic Ecolabelling conclude that the documentation required to verify O38 and O42 can be used as documentation to verify taxonomy compliance.</p> <p>Please note that any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. This is not handled by the Nordic Swan Ecolabel.</p>
<p><b>7.1.1.3: GWP calculation</b> For buildings larger than 5 000 m<sup>2</sup> <sup>(285)</sup>, the life-cycle Global Warming Potential (GWP) <sup>(286)</sup> of the building resulting from the construction has been calculated for each stage in the life cycle and is disclosed to investors and clients on demand.</p>	<p>The GWP- calculation is covered by the requirement "O6 Climate calculation of the building".</p> <p>For buildings larger than 5000 m<sup>2</sup> a calculation in agreement with the requirements in the EU taxonomy must be performed and be disclosed to investors and clients on demand.</p>

<p><sup>(285)</sup> For residential buildings, the calculation and disclosure are made for a representative set of dwelling/apartment types.</p> <p><sup>(286)</sup> The GWP is communicated as a numeric indicator for each life cycle stage expressed as kg CO<sub>2e</sub>/m<sup>2</sup> (of useful internal floor area) averaged for one year of a reference study period of 50 years. The data selection, scenario definition and calculations are carried out in accordance with EN 15978 (BS EN 15978:2011. Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method). The scope of building elements and technical equipment is as defined in the Level(s) common EU framework for indicator 1.2. Where a national calculation tool exists or is required for making disclosures or for obtaining building permits, the respective tool may be used to provide the required disclosure. Other calculation tools may be used if they fulfil the minimum criteria laid down by the Level(s) common EU framework (version of 4.6.2021: <a href="https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents">https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents</a>), see indicator 1.2 user manual.</p>	<p>Where a national calculation tool exists or is required for making disclosures or for obtaining building permits, the respective tool may be used to provide the required disclosure. This is the case in Denmark and Finland. Other countries official tools are not currently in line with the requirements in the EU taxonomy.</p> <p>For the other countries other calculation tools can be used if they fulfil the minimum criteria laid down by the Level(s) common EU framework.</p> <p>For Norway, this is not clear until the Norwegian authorities have made an official interpretation of this part of the EU Taxonomy.</p> <p>In conclusion, it is assessed that the documentation required to verify "O6 Climate calculation of the building" can be used as documentation to verify taxonomy compliance.</p>
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The Do No Significant Harm criteria are according to the internal assessment done by Nordic Ecolabelling assumed to be handled in the following way (please note the disclaimer in the beginning of this section):

DNSH criteria in the EU Taxonomy	Evaluation and relevant requirement in criteria for New buildings
<p><b>7.1.2.1: Climate Change adaption</b> The activity complies with the criteria set out in Appendix A to this Annex.</p>	<p>The requirements defined in Annex A for climate change adaption are covered by the requirements for "P7 Assessment of risks in a changing climate" and "P8 Adaptation to a changing climate".</p> <p>In conclusion, it is assessed that the documentation required to verify P7 and P8 can be used as documentation to verify taxonomy alignment. Please note that these are point requirements, so it is up to the license holder to include these points in the application for the building, in order to assess taxonomy alignment on this DNSH criteria.</p>
<p><b>7.1.3.1: Sustainable use and protection of water and marine resources</b> Where installed, except for installations in residential building units, the specified water use for the following water appliances are attested by product datasheets, a building certification or an existing product label in the Union, in accordance with the technical specifications laid down in Appendix E to this Annex: (a) wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min; (b) showers have a maximum water flow of 8 litres/min; (c) WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres; (d) urinals use a maximum of 2 litres/bowl/hour. Flushing urinals have a maximum full flush volume of 1 litre.</p>	<p>For educational and office buildings the requirements are covered by "P2 Water saving sanitary tapware". Single family homes are not included in the EU Taxonomy requirement. Whether multi-flat or multi-home developments are included in the Taxonomy requirement depend on the operator of the building. See more in the Draft commission notice 2022-12-19 on the EU Taxonomy climate delegated act question nr.nr. 122.</p> <p>It is unclear how the average flush volume should be documented/calculated. To be on the safe side Nordic Ecolabelling have decided to define it as the average between small and large flush volumes and not daily averages. See the Draft commission notice 2022-12-19 on the EU Taxonomy climate delegated act question nr. 123 for further specifications.</p> <p>In conclusion, it is assessed that the documentation required to verify P2 can be used as documentation to verify taxonomy compliance.</p> <p>Please note that this is a point requirement, so it is up to the license holder to include these points in the</p>

	<p>application for the building, in order to assess taxonomy alignment on this DNSH criteria.</p>
<p><b>7.1.3.2: Sustainable use and protection of water and marine resources</b></p> <p>To avoid impact from the construction site, the activity complies with the criteria set out in Appendix B to this Annex.</p>	<p>No requirements in Nordic Ecolabelling's criteria cover Appendix B specifically. It is assessed that this will be handled by national legislation in the Nordic. When obtaining a building permit this issue should have been addressed and handled by the authorities.</p> <p>In conclusion, the applicant should ask for confirmation from the authorities that the requirements in appendix B is fulfilled.</p>
<p><b>7.1.4.1: Transition to a circular economy</b></p> <p>At least 70% (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy and the EU Construction and Demolition Waste Management Protocol <sup>(287)</sup>. Operators limit waste generation in processes related to construction and demolition, in accordance with the EU Construction and Demolition Waste Management Protocol and taking into account best available techniques and using selective demolition to enable removal and safe handling of hazardous substances and facilitate reuse and high-quality recycling by selective removal of materials, using available sorting systems for construction and demolition waste.</p> <p><sup>(287)</sup> EU Construction and Demolition Waste Protocol (version of 4.6.2021: <a href="https://ec.europa.eu/growth/content/eu-construction-anddemolition-waste-protocol-0_en">https://ec.europa.eu/growth/content/eu-construction-anddemolition-waste-protocol-0_en</a>).</p>	<p>The requirement is covered by "O10 Construction waste management" that requires a waste management plan in accordance with the EU Construction and Demolition Waste Management Protocol.</p> <p>Construction waste must be accounted for by reports from the waste management company showing the amounts of relevant waste fractions collected in relation to the total volume of the project's construction waste. The treatment form of the waste fractions and the receiver of the fractions must be stated. Both construction site and module/prefabricated element factories must be accounted for. The mandatory level is in alignment with the requirement in the EU Taxonomy.</p> <p>Demolition waste and requirements for the demolition process (such as selective demolition) is not accounted for in Nordic Swan Ecolabel criteria as the demolition work can have been done years before the start of the construction project. Applicants must account for this separately to verify taxonomy alignment.</p> <p>In conclusion, it is assessed that the documentation required to verify O10 can be used as documentation to verify taxonomy alignment. But it should be noted that demolition waste and the demolition process is not accounted for in these criteria.</p>
<p><b>7.1.4.2: Transition to a circular economy</b></p> <p>Building designs and construction techniques support circularity and in particular demonstrate, with reference to ISO 20887 <sup>(288)</sup> or other standards for assessing the disassembly or adaptability of buildings, how they are designed to be more resource efficient, adaptable, flexible and dismantlable to enable reuse and recycling.</p> <p><sup>(288)</sup> ISO 20887:2020, Sustainability in buildings and civil engineering works - Design for disassembly and adaptability - Principles, requirements, and guidance (version of 4.6.2021: <a href="https://www.iso.org/standard/69370.html">https://www.iso.org/standard/69370.html</a>).</p>	<p>The requirement is covered by the requirement "P18 Design for disassembly and adaptability". The requirement text is in close alignment with the EU taxonomy.</p> <p>However, what must actually be verified to be in alignment with the EU Taxonomy is unclear. According to the Draft commission notice 2022-12-19 on the EU Taxonomy climate delegated act question nr. 125 " a relevant set of measures needs to be put in place by the construction company to demonstrate that a new building is more (a) resource efficient, (b) adaptable, (c) flexible and (d) dismantlable compared to the average new built building." It is not specified what can be considered a average new built building and what is relevant measures.</p> <p>In conclusion, it is assessed that the documentation required to verify P18 can be used as documentation to verify taxonomy alignment. But what level of documentation the EU commission will accept for alignment is not clear.</p> <p>Please note that this is a point requirement, so it is up to the license holder to include these points in the application for the building, in order to assess taxonomy alignment on this DNSH criteria.</p>

<p><b>7.1.5.1: Pollution and prevention control</b> Building components and materials used in the construction comply with the criteria set out in Appendix C to this Annex.</p>	<p>Evaluation of the requirements in annex C:</p> <p>a) It is considered that the requirements in the EU taxonomy and the national legislations are the same. Applicants must always fulfil the current regulatory requirements in relation to their activities. No further documentation is therefore needed.</p> <p>b) The EU Taxonomy do not refer either to the annexes or to the exemptions in the directive and are therefore stricter than the regulation. These criteria regulate the content of mercury in all chemical products O18 and in buildings products covered by O25. For these product types the criteria are aligned with this EU Taxonomy requirement. Products or materials that are not covered by these requirements must be evaluated by the applicant for alignment with this requirement.</p> <p>c) The EU Taxonomy refers to Annexes I and II, but no reference is made to any exemptions, it is therefore stricter than the general regulation. However, the exemptions in question (e.g. (substances used as feedstock, process agents, destruction essential laboratory and analytical uses, hydrochlorofluorocarbons, methyl bromide and halons) do not seem relevant for the products in question. Nordic Ecolabelling will however look further into this.</p> <p>d) The EU Taxonomy refers to Annex II and Article 4(1). EEE placed on the market shall not contain the substances listed in Annex II. RoHS do however have exemptions in Annex III and IV (probably not relevant) which are not mentioned in the taxonomy. The EU taxonomy is therefore stricter than the legislation. In general, electronic equipment is not regulated in these criteria. The applicant should be aware if any exemptions in annex III are relevant as they are not covered by these criteria.</p> <p>e) The EU Taxonomy refers to Annex XVII in REACH. The EU Taxonomy and the national legislations have the same criteria. Applicants must always fulfil the current regulatory requirements in relation to their activities. No further documentation is therefore needed.</p> <p>f) The EU Taxonomy refers to Article 57 and identified in accordance with 59(1), the Candidate List in REACH. This is a list for eventual inclusion in Annex XIV. The EU Taxonomy prohibit the manufacture, placing on the market or use of these substances and is therefore stricter than the national legislation. These criteria restrict the use of substances on the Candidate List for chemical products (O18) and specific listed construction products/materials specific (O25). Products or materials that are not covered by these requirements must be evaluated by the applicant for alignment with this requirement.</p> <p>g) The EU Taxonomy refers to other substances that meet the criteria in Article 57 in REACH. This means substances not yet on the Candidate List. Article 57 include CMR 1A/1B, PBT, vPvB, endocrine disruptors and other substances which give rise to an equivalent level of concern - and which are identified on a case-by-case basis in accordance with the procedure set out in Article 59. These criteria restrict the use of CMRs, PBT, vPvB and endocrine disruptors for all chemical products and specific listed construction products/materials specific (O14/O15/O18/O25).</p> <p>For other substances which give rise to an equivalent level of concern the procedure in art 59 must be followed. This procedure is for the Commission, ECHA</p>
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	<p>and the Member States and is not considered relevant for applicants or producers of the materials and products.</p> <p>Exemptions in these criteria: The exemptions in this criteria are currently not evaluated. The applicant must therefore specifically evaluate alignment with the EU Taxonomy when an exemption is made. Nordic Ecolabelling will work on this issue as soon as possible.</p> <p>Overall conclusion: In general, chemical products and buildings products covered by O25 are assumed to be aligned with the requirements in the EU Taxonomy. However, any exemptions in our criteria are currently not evaluated. The applicant must therefore specifically evaluate alignment with the EU Taxonomy when an exemption is made. Products not covered by these requirements must be evaluated by the applicant for EU Taxonomy alignment. In addition, please note the following:</p> <ul style="list-style-type: none"> <li>• Nordic Ecolabelling must look further into the exemptions regarding bullet c in next generation of the criteria.</li> <li>• Electronic equipment is not regulated in these criteria. The applicant should be aware if any exemptions in annex III are relevant as they are not covered by these criteria.</li> </ul>
<p><b>7.1.5.2: Pollution and prevention control</b> Building components and materials used in the construction that may come into contact with occupiers <sup>(289)</sup> emit less than 0,06 mg of formaldehyde per m<sup>3</sup> of material or component upon testing in accordance with the conditions specified in Annex XVII to Regulation (EC) No 1907/2006 and less than 0,001 mg of other categories 1A and 1B carcinogenic volatile organic compounds per m3 of material or component, upon testing in accordance with CEN/EN 16516 <sup>(290)</sup> or ISO 16000-3:2011 <sup>(291)</sup> or other equivalent standardised test conditions and determination methods <sup>(292)</sup></p> <p><sup>(289)</sup> Applying to paints and varnishes, ceiling tiles, floor coverings, including associated adhesives and sealants, internal insulation and interior surface treatments, such as those to treat damp and mould.</p> <p><sup>(290)</sup> CEN/TS 16516: 2013, Construction products - Assessment of release of dangerous substances - Determination of emissions into indoor air.</p> <p><sup>(291)</sup> ISO 16000-3:2011, Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air — Active sampling method (version of 4.6.2021: <a href="https://www.iso.org/standard/51812.html">https://www.iso.org/standard/51812.html</a>).</p> <p><sup>(292)</sup> The emissions thresholds for carcinogenic volatile organic compounds relate to a 28-day test period.</p>	<p>These requirements are not covered by the Nordic Ecolabel criteria for new buildings. We do not require emission testing for individual building products but set chemical requirements on ingoing chemical substances. Annex XVII to Regulation (EC) No 1907/2006 is not yet implemented, expected release data in Q2 2023 ..</p> <p>According to the Draft commission notice 2022-12-19 on the EU Taxonomy climate delegated act question nr 118 the correct unit is "mg/m3 air".</p> <p>It is unclear what specific products are covered by the requirement.</p> <p>Nordic Ecolabelling does not interpret that it is in line the EU Taxonomy to test the building as a whole instead of testing the individual materials.</p>
<p><b>7.1.5.3: Pollution and prevention control</b> Where the new construction is located on a potentially contaminated site (brownfield site), the site has been subject to an investigation for potential contaminants, for example using standard ISO 18400 <sup>(293)</sup>.</p>	<p>Handling of brownfield sites is considered to be covered by national legislation in all Nordic countries.</p> <p>The applicant can ask for a confirmation by the authorities for the specific areas in question where this is relevant.</p>

<p><b>7.1.5.4: Pollution and prevention control</b> Measures are taken to reduce noise, dust and pollutant emissions during construction or maintenance works.</p>	<p>Handling of noise, dust and pollutant emissions during construction or maintenance work is considered to be covered by national legislation on working environment and environment.</p>
<p><b>7.1.6.1: Protection and restoration of biodiversity and ecosystems</b> The activity complies with the criteria set out in Appendix D to this Annex.</p>	<p>No Nordic Swan Ecolabel requirements cover Appendix D specifically. It is assessed that this will be handled by national legislation in the Nordic. When obtaining a building permit this issue should have been addressed and handled by the authorities.</p> <p>In conclusion, the applicant should ask for confirmation from the authorities that the requirements in appendix D is fulfilled.</p>
<p><b>7.1.6.2: Protection and restoration of biodiversity and ecosystems</b> The new construction is not built on one of the following:</p> <p>(a) arable land and crop land with a moderate to high level of soil fertility and below ground biodiversity as referred to the EU LUCAS survey <sup>(294)</sup>;</p> <p>(b) greenfield land of recognised high biodiversity value and land that serves as habitat of endangered species (flora and fauna) listed on the European Red List <sup>(295)</sup> or the IUCN Red List <sup>(296)</sup>;</p> <p>(c) land matching the definition of forest as set out in national law used in the national greenhouse gas inventory, or where not available, is in accordance with the FAO definition of forest <sup>(297)</sup>.</p> <p><sup>(294)</sup> JRC ESDCA, LUCAS: Land Use and Coverage Area frame Survey version of 4.6.2021: <a href="https://esdac.jrc.ec.europa.eu/projects/lucas">https://esdac.jrc.ec.europa.eu/projects/lucas</a></p> <p><sup>(295)</sup> IUCN, The IUCN European Red List of Threatened Species (version of 4.6.2021: <a href="https://www.iucn.org/regions/europe/our-work/biodiversity-conservation/European-red-list-threatened-species">https://www.iucn.org/regions/europe/our-work/biodiversity-conservation/European-red-list-threatened-species</a>).</p> <p><sup>(296)</sup> IUCN, The IUCN Red List of Threatened Species (version of 4.6.2021: <a href="https://www.iucnredlist.org">https://www.iucnredlist.org</a>).</p> <p><sup>(297)</sup> Land spanning more than 0,5 hectares with trees higher than five meters and a canopy cover of more than 10%, or trees able to reach those thresholds in situ. It does not include land that is predominantly under agricultural or urban land use, FA O Global Resources Assessment 2020. Terms and definitions. (version of 4.6.2021: <a href="http://www.fao.org/3/l8661EN/i8661en.pdf">http://www.fao.org/3/l8661EN/i8661en.pdf</a>).</p>	<p>The requirement is covered by an option in the requirement "P20 Biodiversity measures and ecosystem services". The requirement text is in close alignment with the EU taxonomy and requires that an evaluation report must be done by a biologist/ecologist/landscape architect or person with equivalent competence with experience within mapping biodiversity on building plots/sites.</p> <p>According to the Draft commission notice 2022-12-19 on the EU Taxonomy climate delegated act question nr 112 and 113 it is stated that "any project involving new construction on arable land and crop land with a moderate to high level of soil fertility and below ground biodiversity is considered to do significant harm to biodiversity and ecosystems". Hence it could be interpreted that buildings can only fulfil this requirement if placed in areas already urbanized.</p> <p>However, according to question nr 127 if the relevant land soil fertility is still under research at EU level and below ground biodiversity maps have not yet been published: "if according to the applicable laws and spatial planning regime it would be allowed or permitted by the authorities to build on the parcel of land, this DNSH criterion is always met. So, the provisions here are most relevant in places with no clear zoning/planning law."</p> <p>And according to question nr. 126 "the building permit can be used as proof of compliance to show that new construction is not built on the land types in points (a), (b) and (c) of the criterion."</p> <p>In conclusion, it seems that the EU Taxonomy is still not clear on what areas are allowed to be built on in order to be compliant.</p> <p>Furthermore, the extent to which below ground biodiversity should be assessed is unclear.</p> <p>In conclusion, it is assessed that the documentation required to verify P20 can be used as documentation to verify taxonomy alignment. But what level the EU commission will accept for alignment is not clear as no guidance has been provided.</p> <p>Please note that this is a point requirement, so it is up to the license holder to include these points in the application for the building, in order to assess taxonomy alignment on this DNSH criteria.</p>

## 4 Justification of the requirements

This chapter outlines proposed requirements for generation 4 of the criteria and provides the background as to why the requirement has been included, the proposed requirement level and any delimitation. The appendices referred to in the respective requirements are the appendices to the criteria document.

## 5 What is subject to the requirements?

### **Buildings, supplementary buildings, and outdoor areas**

The Nordic Swan Ecolabel building, outdoor areas on the plot and any permanent supplementary building must fulfil all relevant requirements. Communal/shared areas for residents or occupants are also included, e.g., gyms and hobby rooms in the building. Supplementary buildings are refuse depots, bicycle sheds, storage buildings, garages (both as a separate structure or connected to the building), carports and similar constructions.

Commercial areas such as shop premises, hairdressers, restaurants etc. are exempt from the requirements. Please see the section “What can carry the Nordic Swan Ecolabel?”.

### **General scope of the material requirements**

- The requirements include all materials and products that are incorporated in the Nordic Swan Ecolabel buildings and supplementary buildings included in the project.
- The material requirements apply to all structures above the capillary layer. This includes materials used for insulation of the base plate (above or below the plate) and any radon barrier wherever it is placed.
- Materials used on outdoor areas that are included in the building project and/or delivered by the house manufacturer are covered by relevant requirements. This includes products and construction materials such as decking, fences, pergolas, permanently installed outdoor furniture, playground and park equipment and similar items.
- Installations up to the building are not included. This means, for example, that electrical cables up to the main fuse box are not included.
- Requirements apply to permanently installed fittings, furniture and trimmings as well as loose fittings and furniture (e.g., wardrobes and lockers) that are included in the construction project and sold/let with the residential unit or premise.

### **Exempted areas, materials and products**

The following are not subject to any requirement:

- Technical service areas including lift cabins and lift shafts
- Garage floors and floors in bicycle rooms where there is a need for waterproofing due to a dry level below the floors in question.

- Control units for water, ventilation, and heating.
- Marking paint, marking tape that is removed, cable/pipe lubricant and cleaning agents.
- Sealing foam, formwork oil, etc. used to seal or lubricate casting moulds.
- Touch-up paint for damage to white goods and fittings.
- Rust protection paint to restore railings and beams after welding and when screw holes have been drilled or similar work.
- Builders' hardware (e.g., locks, handles, hole plates and hinges).
- Nails, screws, nuts, bolts, washers and similar fixings and fasteners.
- Palletising trays, plastic spacers, ground spacers, inflow and outflow pipes for white goods and similar items.
- Temporary products and structures used in the construction but later removed. Examples of temporary products and structures are moulds, struts, tarpaulins or plastic film temporarily used for weather protection or sealing. However, wooden products are always covered by O29 such as wood in casting moulds.

Any other exemption must be communicated to Nordic Ecolabelling for approval.

### **Prefabrication**

When anything that would normally have been built on site is built in a module/construction element factory the same chemical and material requirements apply. This for instance includes:

- Prefabricated bathroom modules.
- Sandwich elements and other modules for wall, floor, roof or similar
- Concrete elements (incorporated building products and surface treatment)

Chemical curing products can be used in prefabrication if mixing and application takes place in designated areas and/or with methods and systems protecting from exposure (in accordance with national work environment legislation).

*Curing is a chemical process that produces the hardening of a polymer material by cross-linking of polymer chains. One- or two-component products, where the curing can depend on various factors such as reactive substances, UV light, heat, humidity.*

### **Industrial surface treatments**

Examples where chemical requirements (chapter 6.2) apply:

- Primed and final-coated outdoor wooden panels and boards that are not covered by bullet one below.

Examples where chemical requirements (chapter 6.2) do not apply, but where material requirements on construction products (chapter 6.3 and 6.4) still apply:



- Outdoor wooden facade panels and boards that are primed with a biocidal product (PT8), if all other coatings (including products used at the construction site) are ecolabelled.

Examples where chemical requirements (chapter 6.2) do not apply, but where material requirements on construction products (chapter 6.3 and 6.4) still apply:

- Pre-painted windows, doors, and interiors (mouldings, kitchen and bathroom fittings, indoor stairs)
- Primed and final-coated indoor wooden panels, boards and ceilings
- Fire retardant-treated wood for indoor and outdoor use where the only purpose is to achieve a certain fire protection class.
- Surface-treated steel

## 6 General requirements

### O1 Overall description of the building and the plot

A description of the building(s) and the immediate surroundings must be given, including information/description on the following:

- a) The situation plan, general layouts and facade drawings.
- b) Building type(s) and number of buildings. Buildings and constructions at the construction site that are not included in the application.
- c) Number of storeys, number of square metres (NO: BRA, SE: BOA,LOA, FI: A (netto), DK: Brutto and Netto, IS: A (brutto)).
- d) Commercial spaces or other supplementary activities (canteen, gym etc.) in the building.
- e) System to ensure that office buildings have individual metering of electricity for each rentable unit or each floor.
- f) The carcass/load-bearing structure, facade, roof, foundation, heating system and ventilation system.
- g) Number of residential units. For offices and educational buildings: intended number of users of the building.
- h) Any supplementary buildings such as garages, storerooms, bicycle storage rooms, waste sorting stations, etc.
- i) Outdoor areas including playgrounds and courtyards: layout and materials.
- j) Option catalogue for the tenant/owner to choose from various layouts, materials, or fittings.

Situation plan, general layouts and facade drawings.

- ☒ Documented description of b) to j) above. Appendix 1 or corresponding documentation can be used.

## Background

The purpose of the requirement is to give an overview of the building project that is to be Nordic Swan Ecolabelled and the immediate surroundings. The information is relevant to ensure efficient and correct certification in relation to the rest of the document.

## O2 Points achieved

Projects must fulfil the minimum requirement for total points according to Table 1. Table 2 displays an overview of all point requirements and the minimum number of points that must be achieved for ecolabelled products.

**Table 1 Total minimum number of points**

Building type	DK / NO / SE	FI	IS
Single-family houses, town houses and multifamily homes	28	26	25
Apartment buildings	25	23	22
Offices	25	23	22
Educational Buildings	24	22	21

**Table 2 Summary of all point requirements and minimum number of points required for ecolabelled products**

Area	Requirements on the area
<b>Energy and Climate</b> 20 points available	P1 White goods of better energy class (2p) P2 Water saving sanitary tapware (Educational and office buildings) (1p) P3 Energy efficient or water saving sanitary tapware (2p) P4 Management of electricity demand and power peaks (2p) P5 Local renewable energy generation and energy recovery (3p) P6 Quality assurance of the climate calculation (2p) P7 Assessment of risks in a changing climate (1p) P8 Adaptation to a changing climate (1p) P9 Construction site fuel restrictions (2p) P10 Construction site machinery (2p) P11 Bicycle transport (2p)
<b>Resource efficiency/Circular economy</b> 18 points available	P12 Construction waste optimisation (3p) P13 Construction waste reduction (3p) P14 Producer take-back systems (2p) P15 Reused construction products and materials (4p) P16 Insulating materials from renewable sources (2p) P17 Renewable carcass, façade or inner walls (2p) P18 Design for disassembly and adaptability (2p)
<b>Ecolabelled products</b> 14 points available	P19 Ecolabelled products (14p)  DK/SE/NO: Minimum 8 points FI: Minimum 6 points IS: Minimum 5 points
<b>Biodiversity</b> 6 points available	P20 Biodiversity measures and ecosystem services (6p)

<b>Indoor environment</b> 3 points available	P21 Quality assurance of acoustics (1p) P22 Solar shading and energy efficient cooling technologies (2p)
<b>Innovation and green initiatives</b> 3 points available	P23 Innovation and green initiatives (3p)
<b>Total available points</b>	<b>64</b>

- ☒ Summary of the points that the licensee obtains. Appendix 2 can be used. Documentation needed for each point requirement as described in the relevant requirement.

## Background

This requirement defines the minimum point score for the specific building types. Certain points are more easily available for certain building types. Therefore, the Nordic Swan Ecolabel has implemented differentiated requirements for various building types based on experience from the applications in generation 3 of the criteria. Furthermore, Iceland and Finland have a reduced point requirement due to a lower availability of ecolabelled products in these countries.

## 7 Energy and climate

### 7.1 Energy

#### 03 Energy demand of the building

The building's energy demand must be calculated in accordance with national building legislation, see Appendix 3. The calculated energy demand must at least correspond to:

#### **Denmark:**

All building types: 10% better than BR18 or according to the Low energy class in BR18.

#### **Faroe Islands:**

Single-family houses and townhouses: 35% better than BK17.

Apartment buildings: 25% better than BK17.

Oil furnaces and boilers are not permitted as source of heating.

The air permeability of the building must not exceed 1 l/s.

For the building to be EU Taxonomy aligned, the energy demand must meet the requirement for DK, SE or FI.

*For other building types please contact Nordic Ecolabelling.*

#### **Finland:**

Residential buildings: Energy class A according to the Ministry of the Environment's regulation for buildings' energy performance (1010/ 2017).

Educational buildings\*: 30% better than the regulation limit of 100 kWh/m<sup>2</sup>.

Office buildings: Energy class A according to the Ministry of the Environment's regulation for buildings' energy performance (1010/ 2017).

*\* The same requirement applies for sports halls when included in the licence (and for gymnastics halls if they are calculated separately).*

**Iceland:**

For all building types: 20% better than BRG #112/2012 with later additions. For the building to be EU Taxonomy compliant, the energy demand must meet the requirement for DK, SE or FI.

**Norway:**

For all building types, "energirammetoden" in TEK17 must be applied.

Single-family houses, town houses and multifamily houses: 15% better than TEK17.

Educational buildings\*: 15% better than TEK17.

Apartment buildings: 10% better than TEK17.

Office buildings: 15% better than TEK17.

*\* The same requirement applies for sports halls when included in the licence (and for gymnastics halls if they are calculated separately).*

*No exemptions are made for the energy requirements for log houses or small buildings < 70 m<sup>2</sup>.*

**Sweden:**

Residential buildings: 15% better than BBR.

Educational buildings: 20% better than BBR.

Office buildings: 20% better than BBR.

*The version of BBR to be used is the version in the building permit.*

*No exemptions are made for the energy requirements for small buildings < 50 m<sup>2</sup>.*

**For all building types:**

*The transitional periods set by the national authorities also apply to the fulfilment of Nordic Ecolabelling's energy requirements. If new national legislation and thresholds for a building's energy demand are introduced during the criteria's term of validity, Nordic Ecolabelling will perform a new assessment of the energy requirement and may adjust the requirement, including the percentage, in relation to the new regulations. The adjustment will be made after a national round of consultation.*

*For extensions to existing buildings, the energy requirement must be fulfilled by the extension. The energy calculation must be made for the extension and fulfil the requirements for new buildings.*



Energy calculation according to the national legislation (see specifications in Appendix 3). If the energy demand varies for different building configurations, it must be specified that each configuration in the application fulfils the requirements. Alternatively, the requirements must be fulfilled for the building configuration that has the greatest energy demand.

- ☒ Upon completion of the construction work, an EPC (Energy Performance Certificate) as-built must be handed in to verify the requirement.

## Background

New buildings designed to minimise energy use can make a substantial contribution to climate change mitigation. The requirement ensures alignment with the requirement 7.1.1 in Annex 1 to the Commission Delegated Regulation (EU) 2021/2139 in DK, FI and SE.

National requirements for energy performance/energy efficiency are not directly comparable between the Nordic countries. The countries' requirements include different parts of a building's total energy demand. Other differences concern parameters such as net energy needs, purchased/delivered energy and primary energy. Furthermore, building areas are calculated in different ways, which makes it difficult to compare numbers that are normalised in relation to area. Nordic Ecolabelling has therefore chosen to set energy requirements based on national legislation. The national legislation in all EU countries is based on the EU Directive on the energy performance of buildings 2010/31/EU and the concept of Nearly-zero-energy buildings (NZEB). The energy requirements for Nordic Swan Ecolabel buildings in all Nordic countries are below the national level for nearly-zero-energy buildings, except for Iceland, Faroe Islands and Norway, which has not implemented this legislation. The Icelandic building regulation is not nearly as strict as the ones in the other Nordic countries, as there has been less incentive to improve the energy efficiency in buildings due to the availability of thermal energy. However, the requirement for energy demand of buildings is set to be 20% better than BRG # 112/2012. The levels are set based on licence data and an assessment in each country.

For details in relation to Norway's interpretation and alignment with NZEB and the EU Taxonomy, please refer to section 2 Alignment with the EU Taxonomy framework.

A requirement has been introduced for Faroe Islands. As the building regulation on energy demand is not nearly as strict as the ones in the other Nordic countries both the air permeability, heating source and energy demand of the building is regulated.

## O4 Lighting management

### A Outdoor lighting

#### All building types

All outdoor lighting must have automatic demand control installed, that at least turns lighting off when there's sufficient daylight. The lighting control must be connected to the fixture and not only to/in the light source. This applies to lighting in all common areas, including shared courtyards, shared roof terraces and playgrounds, façade lighting, entrance areas and parking spaces.

All luminaires must be well shielded from the sky with 0% light above the horizontal line of the light fixture.

*Lighting on private terraces and balconies is exempted from the requirement on automatic demand control.*

## **B Indoor lighting**

### **Residential buildings**

- Automatic demand control must be installed in all communal areas such as entrance halls, stairwells, laundry rooms, storage rooms, hobby rooms, meeting rooms, communal kitchens, communal living rooms and communal dining areas.

### **Educational buildings**

- Automatic demand control must be installed in all rooms.
- In rooms with access to daylight, the artificial lighting must dim in response to daylight levels.

### **Office**

- Automatic demand control must be installed in all rooms.
- In rooms with access to daylight, the artificial lighting must dim in response to daylight levels.

### **General exemptions**

- Dormitories in preschools.
- Technical service areas including lifts Lighting for works of art.
- Workplace lighting, worktop lighting and lighting fitted into technical installations and equipment.
- Emergency lighting and lighting in bomb shelters.
- Rooms or spaces in homes for the elderly or persons with disabilities, where lighting for safety reasons cannot switch off.
- For classrooms, rooms for group working and studying as well as common areas in e.g., student housing, co-living apartments, homes for the elderly or persons with disabilities: The lighting should switch off automatically when the room is not in use. However, manual light switches can be used to control the lighting during use of the room.

- Description of the automatic demand control for indoor and outdoor lighting in accordance with the requirement.

## **Background**

Even with the use of energy efficient lighting products, it is important to use automated lighting management to control the use of electricity. Automatic demand control based on daylight could be a daylight sensor or an astronomical timer. Automatic demand control based on presence could be motion detectors, acoustic detection or presence sensors.

For safety and security reasons, outdoor lighting in educational buildings may need to be on throughout the dark and gloomy part of the day. School premises

are often used in the evening for various organised activities, which requires illuminated schoolyards and entrances. Nordic Ecolabelling wants to emphasise that the requirement for automatic lighting management is not in opposition to these needs. The same reasoning applies to areas around residential buildings where lighting is necessary for safety and security reasons, such as parking spaces, entrances or walkways.

Light pollution disturbs birds, bats and insects. All outdoor lighting must therefore be directed towards the ground.

## O5 Energy efficient white goods

Household appliances and professional kitchen appliances must fulfil the energy class requirements in accordance with Tables 3 and 4 below.

If new legislation comes into force during the validity period of the criteria, Nordic Ecolabelling will assess the requirement and an adjustment may be implemented.

**Table 3 Requirements for household white goods**

Product type	Energy labelling according to Energy Label Regulation 2017/1369 (including supplements)	Energy label in accordance with the Energy Labelling Directive 2010/30/EC (including supplements)
Washing machine	B	
Refrigerator	E	
Freezer	E	
Combined refrigerator and freezer	E	
Refrigerator for mini kitchen (height ≤ 80 cm)	F	
Drying cabinets	Must have an energy consumption of no more than 0.4 kWh/kg of laundry	
Tumble dryers		A+++
Combined wash and tumble dryer	D	
Dishwasher	C	
Integrated oven		A+
Oven in free standing stove		A
Electric water heater installed in individual apartments or single-family houses		C

**Table 4 Requirements for professional kitchen appliances**

Product type	Requirement
Boiling pans	At least 90% energy efficiency according to EFCEM's Energy Efficiency Standard for boiling pans or equivalent.
Refrigerators	Class B or better*
Freezers	Class D or better*
Combined freezer/refrigerator cabinets	D or better*

\* Energy class according to Energy Labelling Directive 2010/30/EC (1094/2015/EU)

*Refrigerators and freezers with central cooling systems are not covered by the requirement.*

- ☒ Household appliances: Overview of all household appliances installed in the Nordic Ecolabel building, which includes name/product specification, product type and energy label. For drying cabinets, additional documentation showing the drying cabinet's energy use.
- ☒ For professional kitchen appliances: Overview of all products stating the type of product, product sheet, technical manual or similar document showing fulfilment of the requirement.
- ☒ For boiling pans: Results from tests performed in accordance with EFCEM's Energy Efficiency Standard for boiling pans or equivalent.

## **Background**

Energy classification of household appliances and professional kitchen appliances is an important tool for reducing energy use during the use phase of the building. The requirement on energy efficiency is based on both Energy Labelling Directive 2010/30/EC and Energy Labelling Regulation 2017/1369 with later supplements. The specific requirement concerning the energy label for each product group is set in accordance with the market supply in the Nordic countries.

### *Household appliances*

Electric water heaters are introduced in the requirement since this product group can now be energy labelled. Since there is no energy labelling or eco-design requirement for dryer cabinets often used in preschools and primary schools to dry the children's outerwear, a requirement is expressed in kWh/kg instead

### *Professional kitchens*

Cooking equipment, freezers, refrigerators and dishwashers use the most energy in the kitchen. Nordic Ecolabelling sets requirements for refrigerators, freezers, and boiling pans.

The Energy Labelling Regulation only covers refrigerators and freezers with built-in refrigeration units. Refrigerators and freezers with central cooling systems are not covered and are thus not subject to this requirement.

Boiling pans are large-capacity cooking vessels that stand on the floor. Nordic Ecolabelling requires a boiling pan to be at least 90% energy efficient in accordance with EFCEM's Energy Efficiency Standard for boiling pans.

Nordic Ecolabelling does not set any performance requirements for professional kitchen cookers or dishwashers, as there are no recognised standards for assessing the energy performance of these products.

## **P1 White goods of better energy class**

### **Household white goods**

If all products within a product type/category is one energy class higher than stated in Table 3 in O5, 1 point is given. A product type/category corresponds to a row in Table 3.



## Professional white goods

In communal laundry rooms 1 point is offered if all machines in one product type/category fulfil the following:

- All professional washing machines are coupled to both hot and cold water.
- All professional tumble dryers are equipped with heat pumps.
- All professional drying cabinets are equipped with heat pumps.

A maximum of 2 points can be achieved.

- Overview of all white goods within a product type/category. Product specifications or similar, stating model energy label/energy class or technical specifications.

## Background

This point requirement is a supplement to the obligatory requirement Energy-efficient household appliances and professional kitchen (O5) and will contribute to ensuring that household appliances and professional products of better energy classes than the obligatory level are chosen for Nordic Swan Ecolabel buildings. This will lead to minimised energy consumption during the use phase of the building.

### P2 Water saving sanitary tapware (educational and office buildings)

One point is granted if all sanitary tapware in the building fulfils the maximum water usage in Table 5.

**Table 5 Maximum water usage for sanitary tapware**

Type/category of sanitary tapware	Maximum water usage*
Washbasin taps	6 L/min
Kitchen taps	6 L/min
Showers	8 L/min
WCs, suites, bowls and flushing cisterns	Maximum full flush volume: 6 L Average flush volume: 3.5 L
Urinals	2 L/bowl/h Flushing urinals must have a maximum full flush volume of 1 litre

\*Technical specifications for water appliances should follow Appendix E, Annex 1 to the Commission Delegated Regulation (EU) 2021/2139.

*Bath mixer taps and utility sinks are exempt from the requirement.*

- Overview of the type/model/name of sanitary tapware and documentation of maximum water usage such as product datasheets or product label.

## Background

The requirement in the EU Taxonomy requirement 7.1 DNSH (3) in Annex 1 to the Commission Delegated Regulation (EU) 2021/2139 for water saving sanitary tapware is implemented as a point requirement. Relevant water flows are defined

according to the technical specifications for water appliances should follow Appendix E, Annex 1 to the Commission Delegated Regulation (EU) 2021/2139.

### P3 Energy efficient and water saving sanitary tapware and technologies

Savings in water and energy used for tap water is rewarded:

- One point is given if all products within a product category fulfil the relevant energy class (according to SS 820000 or SS 820001) or have touchless operation, see Table 6.
- Installation of water saving systems that reuse greywater or rainwater for toilet flushing gives 2 points.

Maximum 2 points are available.

**Table 6 Energy labelled or water saving sanitary tapware**

Type/category of sanitary tapware	Energy class according to SS 820000 and SS 820001	Points
Washbasin and mixer taps	A	1
Kitchen taps	B	1
Thermostatic mixers with shower*	B	1

\* Points are only awarded for an installed hand shower. When there is both an overhead shower and a hand shower function points are only awarded with a verification by certification bodies, showing that both the overhead shower and the hand shower function meet the relevant energy class.

Bath mixer taps, tapware in utility sinks in broom cupboards, two-handle shower mixers and sanitary fixtures for separate purposes that are not intended for household use are exempt from the requirement.

- Energy labelled taps or touchless taps: Overview of the type/model/name of sanitary tapware and the energy class label, certificate number and name of the standard.
- Description of the installation for reuse of greywater/rainwater.

### Background

The purpose is to reduce energy use by selecting energy efficient taps for kitchens, washbasins and showers. Touchless taps save both energy and water primarily in educational and office buildings, by ensuring that taps are never left on. Reuse of greywater from e.g., showers or bathtubs has been added to promote further water saving measures. Reuse of rainwater has also been added to the requirement to lower the need for tap water for toilet flushing.

### P4 Management of electricity consumption and power peaks

Management of electricity consumption that contributes to reduction of power peaks in the electrical grid is rewarded. A maximum of 2 points can be achieved. The control system for relevant measure(s) must automatically take into account the hourly/spot price for electricity or power peaks in the power grid. The following measures give one point each:

- Control of all individual or common electric water heaters

- Control of all electric car chargers
- Control of all electric space heating sources\*

*Control that takes place using devices such as smart plugs that are connected between the socket and the plug does not give points. In addition, the system must be able to communicate via the most common open communication protocols.*

*\*Must include the possibility of lowering the consumption at night for all building types and in addition lowering the consumption during weekends in educational- and office buildings.*

- ☒ The installed system must be documented according to the requirement (product data sheet, description of the electrical system, etc).

## Background

The electricity grid is dimensioned to accommodate peak loads in the electricity consumption<sup>1</sup>. To reduce the need for grid investments, and to reduce electricity consumption, load shifting, and peak shaving are possible strategies. There are several smart home solutions on the market that make this possible. Some energy suppliers offer the possibility of switching off equipment when prices are high. In a few years, we expect that systems will be established that enable load aggregators to trade flexibility in a local flexibility market. This point requirement also applies to such systems.

Electric water- and space-heating (heat pumps or direct-acting electricity) is the part that households can influence to the greatest effect. In addition, heating can be controlled for a few hours without causing any noticeable reduction in comfort for households because there is a degree of thermal inertia in the house.<sup>2</sup>

Nordic Ecolabelling considers that the system should be automatic to contribute to levelling out peaks in electricity use (peak shaving). Household electricity for the likes of lighting and appliances does not need to be included in the system because the potential will be lower.

## P5 Local renewable energy generation and energy recovery

Installed solar panels (photo-voltaic, PV), solar thermal collectors, systems for wastewater heat recovery and liquid-to-water heat pumps can give a maximum of 3 points. The installations must be situated on/in the building or in the immediate vicinity and at least fulfil the following measures for the building/project:

- a) Solar PV panels showing an estimated electricity production of minimum:
  - 5 kWh/m<sup>2</sup> /year gives 1 point.
  - 10 kWh/m<sup>2</sup> /year gives 2 points.

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<sup>1</sup> L. Ødegården and S. Bhantana, "Status og prognoser for kraftsystemet 2018-NVE," 2018.

Available at: [http://publikasjoner.nve.no/rapport/2018/rapport2018\\_103.pdf](http://publikasjoner.nve.no/rapport/2018/rapport2018_103.pdf)

<sup>2</sup> Karin Alvehag et al. Åtgärder för ökad efterfrågeflexibilitet i det svenska elsystemet (2016)

Swedish Energy Markets Inspectorate. Available at:

[https://www.ei.se/Documents/Publikationer/rapporter\\_och\\_pm/Rapporter%202016/Ei\\_R2016\\_15.pdf](https://www.ei.se/Documents/Publikationer/rapporter_och_pm/Rapporter%202016/Ei_R2016_15.pdf)

- 15 kWh/m<sup>2</sup> /year gives 3 points.

*Area to be used: DK: Netto, FI: A (Netto), IS: A (Netto), NO: BRA, SE: NTA*

b) Solar collectors with an estimated energy generation of minimum:

- 20% of the energy for hot water per year gives 1 point
- 40% of the energy for hot water per year gives 2 points
- 60% of the energy for hot water per year gives 3 points

If solar collectors deliver surplus energy to increase the inlet temperature of a heat pump, one extra point is given.

- c) Wastewater heat recovery installation gives 2 points. Heat must be recovered from >50% of the showers, or from the relevant appliances in e.g., a professional kitchen or a communal laundry room.
- d) Liquid-to-water heat pumps that supply minimum 90% of the estimated heating need for hot water, space heating and ventilation. Points can only be achieved outside district heating areas. 1 point.

- ☒ Description of the installation of the solar PV panels, its location and calculated annual energy generation relative to the heated floor area of the building.
- ☒ Description of the installation of solar thermal collectors, its location, calculated annual energy generation relative to the building's energy demand for hot water.
- ☒ Description of the installation for wastewater heat recovery and its location.
- ☒ Description of the installation of the liquid-to-water heat pump and the supplied energy delivered in relation to the total heating demand for hot water, space heating and ventilation.

## Background

To support a transition to a net-zero emissions economy and to reduce the need for bought energy, points will be given for installed solar PV panels, solar thermal collectors, and systems for wastewater heat recovery. The aim of the requirement is, as in earlier generations of the criteria, to stimulate energy sources and energy recovery that might not normally be installed.

The installations can be in/on the building or in the immediate vicinity. A neighbouring building or a supplementary building are also approved if the electricity generated supplies the Nordic Swan Ecolabel building or project. The building regulations of the various Nordic countries give various weighting to local and renewable energy sources, but Nordic Ecolabelling does not see this as an impediment to the point requirement.

Various activities in areas such as communal laundries in apartment buildings, shower facilities in educational buildings and sport halls, school kitchens, etc. will be suitable for wastewater heat recovery. The technology will reduce the energy demand for water heating using energy that is otherwise dissipated into the ground.

Liquid-to-water heat pumps are an efficient alternative to electric heating panels and air-to-air heat pumps. This is especially the case in the parts of the Nordic region where winters are cold. Therefore, the Nordic Swan Ecolabel gives points for these installations even though in some regions they are relatively common. Points can only be achieved outside district heating areas, since it is favourable to use the low exergy waste heat that is part of many district heating systems. Many district heating systems are phasing out fossil fuels. Exhaust air heat pumps heat pumps and air-to-water heat pumps are standard installations in large parts of the Nordic region and do not give points.

Local wind turbines do not give points as they are problematic due to noise.

## 7.2 Climate

### 06 Climate calculation of the building

#### **Buildings $\geq 5000 \text{ m}^2$ useful internal floor area (as defined in the EU Taxonomy).**

Compliance with the EU Taxonomy must be documented\*. The climate calculation must be submitted to Nordic Ecolabelling and must also be disclosed to investors and clients on demand.

The following official national calculation tools must be used:

Denmark: Official calculation tool accepted in BR18.

Finland: Method for the whole life carbon assessment of buildings, Ministry of the Environment (2019:23).

Iceland/ Sweden: Calculation tools that fulfil Level(s) common EU framework (version of 4.6.2021: <https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents>), see indicator 1.2 user manual.

Norway: Not relevant for the time being. Instead, the buildings must comply with the requirement in the section for buildings  $< 5000 \text{ m}^2$ .

*\*The requirement does not apply in Norway before the Norwegian authorities have made an official interpretation of this part of the EU Taxonomy.*

#### **Buildings $< 5000 \text{ m}^2$ useful internal floor area (as defined in the EU Taxonomy)**

In countries where the authorities have implemented a system for obligatory or voluntary climate calculation, this calculation must be submitted to Nordic Ecolabelling.

The following official national calculation tools must be used:

Denmark: Official calculation tool accepted in BR18.

Finland: Method for the whole life carbon assessment of buildings, Ministry of the Environment (2019:23) or other corresponding taxonomy compliant method. When the regulation for the climate assessment of the building comes into force, the calculation method shall comply with the regulation.

Iceland/Sweden: Calculation tools/method accepted in national building legislation.

Norway: Official calculation tool accepted in TEK17.

### Threshold limits:

The climate calculation must document that the building or building project fulfils the following national threshold limits\*:

**Table 7 National threshold limits**

Country	Threshold limit
Denmark	01-01-2023 to 01-01-2025 < 10.5 kg CO <sub>2</sub> eq/m <sup>2</sup> (Will be tightened accordingly to the next coming threshold in BR18)**
Finland	No limit for the time being
Iceland	No limit for the time being
Norway	No limit for the time being
Sweden	No limit for the time being

\* A limit value that is stricter than the authorities' obligatory requirements (where the authorities have introduced a limit value) will be determined by Nordic Ecolabelling after a national consultation. There will be a notification period before a requirement limit is introduced.

\*\* The threshold limit is defined as the next obligatory threshold limit from the building legislation (BR18) and will be tightened accordingly. If the threshold limits in the building regulation (BR18) are changed, this requirement will be adjusted accordingly. The calculation must always be performed according to the current version of the calculation method and scope of the calculation.

- ☒ Buildings ≥ 5000 m<sup>2</sup>: Climate calculation that complies with the requirements of the EU Taxonomy. Documentation that the threshold limit is fulfilled.
- ☒ Buildings < 5000 m<sup>2</sup>: Climate calculation according to the authorities' requirements for calculation methods. Documentation that the threshold limit is fulfilled.

## Background

A greenhouse gas calculation for the entire life cycle of the building has the advantage that all emissions are considered. For example, the need for replacement of building parts and consequences of other measures such as material selection, construction, etc. are included in the calculations. At the same time, a total CO<sub>2e</sub> figure is achieved per m<sup>2</sup> and year or over the entire technically determined service life of the building. In principle, such calculations can be compared with other buildings with the same function. However, it requires that the assumptions for the greenhouse gas calculations are the same and that the quality of the design and the detailed data used are high. In a full assessment the modules A–D are all assessed (A: production and implementation, B: use phase, C: end of life and D: consequences outside the system boundary).

In Sweden a new law entered into force from 1 January 2022 specifying that all buildings must have a climate declaration that is submitted together with the application for a building permit. Finland is currently trialling voluntary submission of a climate declaration. In Denmark there will be a legal requirement in 2023 with a CO<sub>2e</sub> limit value for buildings over 1000 m<sup>2</sup> and with an even stricter voluntary requirement which is an optional part of the Danish building regulations.

The biggest difference is which phases in the building's life cycle are included in the calculations. The Swedish climate declaration only includes module A, covering the production phase and the implementation phase. The Danish calculation also includes parts of modules B and C as well as module D. The Finnish climate declaration has the most phases of the government methods.

In Norway, the authorities require that the calculation of greenhouse gas emissions as a minimum include modules A1–A4, B2 and B4. In addition, the waste from the construction site must be included in the greenhouse gas emission calculation. In Norway, two different scenarios for the estimated climate impact from purchased electricity must be calculated according to the standard. Scenario 1 is based on the Norwegian consumption mix and Scenario 2 on the EU's consumption mix (EU28+NO). In addition to the calculations, you can also state whether an agreement for guarantees of origin has been entered into, and if so, also the time period for the agreement.

Due to the Nordic differences, Nordic Ecolabelling requires calculations to be based on the principles of the EU Taxonomy for all buildings and building projects above 5000 m<sup>2</sup> useful internal floor area. The limits for the EU Taxonomy are defined according to "Useful internal floor area is interpreted". EU's reporting tool LEVEL(s) User manual 2 further describes it: IPMS measurement standard 3 for office buildings and IPMS measurement standard 3B. Official national calculation tools can be used to perform the calculation when in compliance with the EU Taxonomy. There are no obligatory requirements for the calculation methods or databases used in addition to what is required by the authorities. Specific threshold values will be defined as the Nordic countries implement them in their legislation. Currently only Denmark has a threshold limit for the climate declaration set by the authorities. It is set at 12 kg CO<sub>2e</sub>/m<sup>2</sup>/year in the building legislation where a tightened threshold limit at 10, 5 kg CO<sub>2e</sub>/m<sup>2</sup>/year will be introduced in 2025. Further tightening is planned in 2027 and 2029. The requirement threshold for the Nordic Swan Ecolabel in Denmark is defined as the next coming obligatory threshold limit from the authorities building regulation (BR18). This means a requirement threshold at 10,5 kg CO<sub>2e</sub>/m<sup>2</sup>/year from 2023. If the calculation method or the threshold limits in the building regulation (BR18) are changed, this requirement will be adjusted accordingly. The calculation must always be performed according to the current version of the calculation method and scope of the calculation.

## P6 Quality assurance of the climate calculation

One point is awarded for each of the following quality measures a–d in the climate declaration/calculation\* for the building. A maximum of 2 points can be achieved.

*For projects that consist of several independent buildings, a calculation must be submitted for at least one of the (main) buildings in the project.*

- a) Quality of the climate declaration: The calculation and any of the used quality measures stated in this requirement must be verified by an external third-party specialist.
- b) Completeness of the calculation: There must be performed a mass balance that compares the flow of resources into the building system to the flow of emissions, wastes, and by-products out of the building system. The completeness must be reported as the percentage deviation between dry mass inputs and dry mass outputs for the full building system and for individual unit processes representing mass flows summing to at least 90% of the total static mass of the building.
- c) Data quality: At least 50% of the total contribution to greenhouse gas emissions from the materials included in the calculation is based on product specific EPDs.
- d) A calculation is performed in at least the two stated stages:
  - The targeted, projected building
  - The completed building, as built

*\* The climate declaration/calculation must be based on EN15978 and performed using either a national standard, a government-authorized method or according to Level (s).<sup>3</sup>*

- a) The climate declaration, a signed quality verification and description of education and/or experience of external third-party specialist.
- b) Documentation for the completeness of the calculation in accordance with bullet b).
- c) Product specific EPDs for the relevant materials and a verification that a minimum of 50% of the contribution to greenhouse gas emissions from the materials are covered by these EPDs.
- d) The climate declaration and documentation for the two-stage calculation for the projected building and the completed building.

## Background

Performing a climate gas calculation involves a great deal of data, assumptions and choices and it is therefore difficult to determine how credible a calculation is and thus how useful it is as a tool for reducing climate impact.

There are ongoing developments in the Nordic countries in relation to CO<sub>2</sub> calculations for construction, for example regarding calculation tools, databases, several product specific EPDs and various requirements in the voluntary building certification system and standards. Nordic Ecolabelling wishes to contribute to these developments by giving points when the calculations meet one or more quality requirements.

<sup>3</sup> [https://ec.europa.eu/environment/levels\\_en](https://ec.europa.eu/environment/levels_en)



With support from the Nordic Council of Ministers, Nordic Ecolabelling has had a report carried out by 2.-0 LCA Consultants – “Assessment of the feasibility and potential impact of adding additional ecolabel criteria for global warming impacts of buildings and building materials”. This report recommends that the Nordic Ecolabel contributes to the development of calculation methods for greenhouse gas emissions with quality requirements. The report points out that current life cycle-based CO<sub>2</sub> calculations for buildings do not provide results that are sufficiently consistent and comparable. The consultant report also recommends that CO<sub>2</sub> calculations should be performed at a comprehensive building level and in several stages of the project. The Nordic Ecolabel gives points if calculations have been performed for at least 2 different phases in the project. The greenhouse gas calculation must as a minimum be based on EN15978 and performed with either a national standard, an authority-designated method or according to Level (s) before the quality measures are added.

There are several ways to improve the quality of greenhouse gas calculations. The quality measures relevant for this criterion are determined by what is possible to influence with a type 1 ecolabel. Here points are awarded to construction projects where special consideration is given to the completeness of the calculation, third-party specialist control, data quality (use of product specific EPDs) and two stage calculations. Overall, the aim is improving the quality of the calculations in order to have more robust results to guide the applicant in lowering the climate impact of the building.

#### P7 Assessment of risks in a changing climate

One point is granted for the following:

A climate risk and vulnerability analysis of the building and property must be performed, including the following parts a)-c):

- a) Screening of which physical climate risks from Table 8 that may affect the performance of the building during its expected lifetime (minimum 50 years).
- b) Assessment of the significance of the identified physical climate risks for the building and property.
- c) Suggestions of climate adaptation measures that could be implemented to reduce the most significant identified physical climate risks.

The climate and vulnerability analysis must be based on RCP (Representative Concentration Pathways) scenarios from IPCC and consider the latest research in the field and correspond to a period of at least 50 years. Methods and source material used to carry out the mapping of potential climate risks, as well as the method used to evaluate identified risks should be presented.

*Risk assessments should be performed using the highest available resolution and state-of-the-art climate projections across the existing future scenarios RCP2.6, RCP4.5, RCP6.0 and RCP8.5 according to IPCC.*

**Table 8 Classification of climate-related hazards**

	Temperature related	Wind-related	Water-related	Solid mass-related
Chronic	Changing temperature (air, freshwater, marine water)	Changing wind patterns	Changing precipitation patterns and types (rain, hail, snow/ice)	Coastal erosion
	Heat Stress		Precipitation or hydrological variability	Soil degradation
	Temperature variability		Ocean acidification	Soil erosion
	Permafrost thawing		Saline intrusion	Solifluction
			Sea level rise	
			Water stress	
Acute	Heat wave	Cyclone, hurricane, typhoon	Drought	Avalanche
	Cold wave/frost	Storm (including blizzards, dust and sandstorms)	Heavy precipitation (rain, hail, snow/ice)	Landslide
	Wildfire	Tornado	Flood (coastal, fluvial, pluvial, ground water)	Subsidence
			Glacial lake outburst	

☒ Climate and vulnerability analysis covering all points in the requirement.

### P8 Adaptation to a changing climate

One point is granted for the following:

Based on the climate risk and vulnerability analysis in P7, the most important identified climate adaptation measures must be implemented before the building is taken into use.

The adaptation measures must:

- Not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities.
- Promote nature-based solutions\* or to the extent possible rely on blue or green infrastructure\*\*.
- Be consistent with local, sectoral, regional, or national strategies and plans.

\* *Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social, and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes, and seascapes, through locally adapted, resource-efficient and systemic interventions.*

[https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions\\_en](https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en)

*\*\* Green infrastructure (GI) – Enhancing Europe’s Natural Capital (COM(2013) 249 final*

- ☒ Documentation describing climate adaptation measures that will be carried out to reduce significant climate risks for the project. It must be clearly described how the measures contribute to reducing the relevant climate risks.

## Background P7 and P8

Climate change is giving rise to a warmer climate and more extreme weather. Problems with heat waves, floods and heavy downpours are present today and will become more frequent. The construction sector has good opportunities to reduce future damage and health hazards in the built environment by working with climate change adaptation<sup>4</sup>.

In Sweden and Denmark, the ultimate responsibility for implementing climate adaptation measures on the property lies with landowners, developers, and property owners<sup>5</sup>. Municipalities have the main responsibility for implementing climate-adapted measures in the planning work in Norway, Sweden, and Finland<sup>6</sup>. In Denmark, climate adaptation is primarily regulated by laws and regulations, and Norway also has legislation that covers climate adaptation. Iceland currently has no requirements for climate adaptation. There are holes to fill in the Nordic climate adaptation work of properties and Nordic Ecolabelling wishes to encourage developers and property owners to work more with climate adaptation.

The climate adaptation requirements are designed to be aligned with the DNSH criteria of the EU taxonomy for sustainable activities.

Nature-based solutions are multifunctional measures that, in their design, are based on the functions that ecosystems possess and contribute, i.e., ecosystem services. By using nature-based solutions, ecosystems benefit while providing socially beneficial functions<sup>7</sup>. Nature-based solutions promote climate adaptation in a variety of ways and can, for example, improve resilience to floods and extreme rainfall, provide coolness for residents and cool building surfaces such as roofs and walls, and reduce risks of collapse and landslides.

## 07 Cement and concrete

The climate impact originating from cement and concrete must be accounted for according to the national requirements below.

EPDs must be produced in accordance with ISO 15804/ EN 16757:2017 and ISO 14025 and must either be:

- third-party verified according to ISO 14025, or
- produced using a third-party reviewed EPD tool for cement or concrete according to ISO 14025.

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<sup>4</sup> Klimatanpassa din fastighet. Fastighetsägarna

<sup>5</sup> 2017/18:163 Nationell strategi för klimatanpassning

<sup>6</sup> PBL 2010:900

<sup>7</sup> Naturbaserade lösningar. Naturvårdsverket.

The requirements for prefabricated elements can alternatively be met by using a minimum of 30% reused elements. The reused concrete must be assessed according to requirement O12.

**Denmark:**

Minimum 90% (weight or volume) of the ready-mix concrete used at the construction site and 90% (weight or volume) of the concrete elements must be documented by a product specific EPD. The EPD data must be used in the climate declaration in O6.

*EPD-generator from Dansk Beton can be used.*

**Finland:**

Minimum 70% (weight or volume) of the ready-mixed concrete used at the construction site must document compliance with the concrete class GWP.85 or better in BY Low Carbon Classification, Finish concrete association. (<https://vahahiilinenbetoni.fi/in-english/>)

Minimum 70% (weight or volume) of the concrete used in prefabricated elements\* must document compliance with the concrete class GWP.85 or better in BY Low Carbon Classification, Finish concrete association. (<https://vahahiilinenbetoni.fi/in-english/>)

*The Finnish Concrete Associations Low-carbon calculator can be used.*

**Iceland:**

Minimum 90% (weight or volume) of the ready-mix concrete used at the construction site and 90% (weight or volume) of the concrete elements must be documented by a product specific EPD. The EPD data must be used in the climate declaration in O6.

For at least two types of concrete construction parts (foundations, load bearing systems, floor decks, wall elements, roof elements or facade elements) a minimum of 50% (weight or volume) of the binder used in the concrete must contain maximum 70% by weight of cement clinker.

*Cement clinker is defined as the ratio of Portland cement clinker in the cement, in accordance with the definition in EN 197-1. Cement clinker is thus also included in the cement mix in the finished concrete. For concrete, the cement clinker ratio in the cement mix used in the concrete is calculated.*

**Norway:**

Minimum 70% (weight or volume) of the ready-mixed concrete used at the construction site must comply with Low carbon concrete A or better in the Norwegian Concrete Association's publication no. 37 Low carbon concrete (NB37).

Minimum 70% (weight or volume) of the concrete used in prefabricated elements\* must document compliance with low carbon concrete A or better in the Norwegian Concrete Association's publication no. 37 Low carbon concrete (NB37).

*EPD generator provided through membership in Betongfokus and Betong Norge - Betongelementforeningen can be used.*

**Sweden:**

Minimum 70% (weight or volume) of the ready-mixed concrete used at the construction site must comply with level 2 of "Vägledning Klimatförbättrad betong", published by Svensk Betong.

Minimum 70% (weight or volume) of the concrete used in prefabricated elements must document compliance level 2 of "Vägledning Klimatförbättrad betong", published by Svensk Betong.

*\*Prefabricated elements include: Slabs between floors and roof slabs, walls between flats, outer or inner walls, lift shafts, stairs, facade elements and balconies.*

- ☒ FI/NO/SE: Product specific EPD from the concrete manufacturer showing that the relevant concrete products meet the requirement of the national concrete classification system for greenhouse gas emissions for the required strength class.
- ☒ DK/IS: Product specific EPD from the concrete manufacturer and confirmation that the specific data is used in the climate calculation in O6.
- ☒ IS: Overview of the concrete construction part types that fulfill <70% of cement clinker and a calculation showing that the construction parts constitute at least 50% of the need in the building.
- ☒ IS: Product data sheet, eBVD or EPD stating the cement clinker content for the cement/concrete construction parts.
- ☒ All countries: Total amount of delivered ready-mixed concrete and prefabricated elements and amount of delivered concrete that fulfils the required concrete class.

**Background**

Cement-based materials are often used in large quantities in a building<sup>8, 9, 10</sup> and they are produced in energy intensive and CO<sub>2</sub> emitting processes. Concrete typically accounts for 34–40% of the GHG emissions of office buildings, educational buildings, apartment blocks and homes for the elderly.<sup>11</sup> Nordic Ecolabelling has defined an obligatory requirement in order to help lower the GHG emissions associated with these structures and processes.

The requirements are based on the national concrete classification systems in SE, NO and FI. The classification systems provide guidelines on how to calculate the emissions. This is important because inconsistencies in data for EPDs for cement,

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<sup>8</sup> Life cycle assessment of MiniCO<sub>2</sub> houses in Nyborg, Danish Building Research Institute, 2013.

<sup>9</sup> A. Dodoo, Life Cycle Primary Energy Use and Carbon Emission of Residential Buildings, 2011.

<sup>10</sup> Solem, Bård: Bærekraftige materialvalg (2018) Preentasjon på Samling 1 i prosjektet Fra ide til realisering - bærekraftig bygg under Innovative anskaffelser - Nasjonalt program for leverandørutvikling. Available at: <https://innovativeanskaffelser.no/wp-content/uploads/2018/10/181023-baerekraftig-materialvalg-bard-solem-eggen-arkitekter.pdf>

<sup>11</sup> Fuglseth, M., et al. (2020) Studie potensial og barrierer for bruk av klimavennlige materialer - Potensial og barrierer klimavennlige materialer. Utarbeidet for Enova. Available at <https://www.enova.no/bedrift/bygg-og-eiendom/tema/klimavennlige-byggematerialer/>

aggregates and concrete have been found in individual EPDs.<sup>12</sup> The industry reference, which is used to estimate savings in GHG emissions, uses national generic values. The threshold limits and concrete classes for each country are defined in dialogue with the manufactures and the national concrete association. Documentation must be done according to national EPD-tools.

In Denmark there is no classification system for concrete. Nordic Ecolabelling has assessed the possibility to define its own concrete class system for Denmark. The conclusion was however that there is not sufficient reliable data available to define a fair concrete classification system. The data available is very limited for both ready mixed concrete and especially for elements, piles etc.

In Denmark the specific concrete products / materials used must be verified by product specific EPDs for both ready mixed concrete and elements. The data must be used in the climate calculation O6. In the Danish building legislation, a threshold limit for CO<sub>2</sub> emissions will be introduced in 2023. To be sure to minimize the CO<sub>2</sub> emissions of the building, Denmark has a limit stricter than the authorities. The input Nordic Ecolabelling has got from consultants performing the calculations is that the introduced limit in O7 will in fact result in CO<sub>2</sub> reductions in concrete/cement in buildings with loadbearing structures in concrete. In practice the GWP calculation will therefore drive the change in the sector in Denmark.

Iceland has no classification system but the producers must provide product specific EPDs. In addition a requirement is set on the content of cement clinker on minimum two building parts.

## O8 Steel production

The requirement applies to the following construction materials/building parts:

- Facade panels in steel > 20% of the façade area (excluding window/door area)
- Load bearing constructions in steel > 20% by weight of the buildings loadbearing system

*Steel rebars are not covered by this requirement.*

- Calculation showing that facade panels and load bearing constructions consist of <20% steel, or:

The relevant building parts must fulfil one of the alternatives A-C:

### **A) High proportion of recycled content**

A minimum of 75% by weight of the steel must be recycled.

Recycled is defined as both pre- and post-consumer, according to definitions in ISO 14021.

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<sup>12</sup> Anderson, J. and Moncaster, A.: Embodied carbon of concrete in buildings, Part 1: analysis of published EPD (2020). Available at: [https://www.researchgate.net/publication/341943113\\_Embodied\\_carbon\\_of\\_concrete\\_in\\_buildings\\_Part\\_1\\_analysis\\_of\\_published\\_EP](https://www.researchgate.net/publication/341943113_Embodied_carbon_of_concrete_in_buildings_Part_1_analysis_of_published_EP)

Fulfilment is shown through either:

- A signed agreement between the steel supplier and the the applicant stating that the requirement is met, the declaration from the steel supplier can be based on purchase records/average data from several steel sub suppliers / manufacturers, or
- eBVD or EPD based on product-specific data/data from the steel producer's own production stating the content of recycled steel in the product.

Signed agreement as described above.

eBVD or EPD as described above.

### **B) Reused steel parts**

At least 50% of the façade panels or load-bearing steel construction must be reused building parts. Traceability back to the parts' most recent use in construction must be documented.

*The reused steel parts must comply with requirement O12.*

Reused steel products must be accounted for and the traceability back to the parts' most recent use in construction must be documented.

### **C) Virgin steel production**

The requirement can be verified using either: Direct traceability through the supply chain or mass balance approach<sup>13</sup>.

The requirement can be met by fulfilling one the three alternatives (1-3) below:

#### ***1. Steel produced from traditional methods***

The steel origins from a steel producer who has:

- implemented at least 2 of the energy efficiency measures stated as BAT in the BREF document for iron and steel production (2013 or later version). The energy efficiency measures are listed in Table 1 in Appendix 4, and
- an active sustainability strategy focusing on reducing energy consumption and greenhouse gas emissions. The strategy for reducing energy consumption and greenhouse gas emissions shall be quantitative and time-based and must be determined by the company management.

Enclose latest sustainability strategy report or equivalent documentation from the steel producer showing fulfilment of the requirement. The steel producer can also present specific targets from annual business report

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<sup>13</sup> In case of several potential steel producers, the supplier of the metal components can verify the requirement by using a mass balance approach if there is an account documenting the annual volumes purchased from the individuals steel producers. The volumes must correspond to volumes sold to the applicant (e.g., cannot sell a larger volume than the corresponding quantity purchased from the individual steel producers)

with reference to specific numbers and assumptions. Average numbers from steel producers with several steel melting plants is accepted.

- ☒ Description of which energy efficiency measures stated as BAT have been implemented at the production site.
- ☒ Information on type of traceability used to document the requirement.

### ***2. Responsible steel certified production site***

A minimum of 50% by weight of the steel covered by the requirement comes from a production site that is certified according to the standard Responsible Steel<sup>14</sup>, version 1.0, 2019 or later versions.

- ☒ Enclose valid Responsible Steel certificate from the steel producer.
- ☒ Information from the supplier/manufacturer of the constituent steel part about which metal parts are from certified metal production (purchase records).
- ☒ Information from the supplier/manufacturer of the constituent steel parts on the type of traceability used to document the requirement.
- ☒ Documentation from the applicant that the requirement for share of purchased steel from certified steel producers is fulfilled – e.g., invoices or other documentation from suppliers.

### ***3. Steel production based on new technologies with reduced greenhouse gas emissions***

The steel origins from steel production sites that have implemented one of the following technologies:

- direct electrolysis of iron ore
- blast furnace top gas recycling with carbon capture and storage
- direct smelting reduction processes
- hydrogen steelmaking in shaft furnaces using green H<sub>2</sub>

- ☒ State the name of the steel producer and production site where the steel comes from, as well as a brief description of which technology is used.
- ☒ Information on type of traceability used to document the requirement.

## **Background**

Using recycled metal can reduce the environmental impact and provides a significant climate benefit. Among other things, this is highlighted in the taxonomy work in the EU<sup>15</sup>. Nordic Ecolabelling is aware that the availability of

<sup>14</sup> Overview of certified steel producers, <https://www.responsiblesteel.org/certification/issued-certificates/>

<sup>15</sup> Taxonomy report, technical annex, EU technical expert group on sustainable finance, March 2020.



recycled metal and traceability can be a challenge. Traceability in the production chain is also a value in itself, and is important for several aspects, e.g., it provides opportunities to select suppliers based on environmental work, working conditions, quality etc.

Among the most common building materials, steel is the only material that can be recycled 100% without losing its quality.<sup>16</sup> It is also a material that is suitable for reuse, and compared to recycled steel, reused steel has 80% lower climate gas emissions. Hence, both recycling and reuse of steel should be encouraged to reduce the carbon footprint of buildings. The two steel production processes are Basic Oxygen Furnace (BOF) for which the input is iron ore, and Electric Arc Furnace (EAF) for which the input is mainly scrap steel. It is necessary to have an ambitious requirement to promote the use of recycled steel and traceability. In practice, this means that steel that should contain more than 20% recycled steel and must be produced at plants that use EAF technology. There are steel producers using the EAF process across the whole of Europe.<sup>17</sup> According to the World Steel Association<sup>18</sup> the EU produces 58% of steel using BOF and 41% using EAF technology. Globally, approx. 70% is produced using BOF and 30% using EAF technology.

Nordic Ecolabelling has introduced requirements for iron ore-based steel production. Requirements for metal can therefore be met either by including a high proportion of recycled, or by fulfilling several requirements for primary metal production. The requirement model is based on an obligatory requirement for the producer to have an energy and greenhouse gas calculation with defined reduction targets.

Certification with Responsible Steel is something that Nordic Ecolabelling sees as a positive initiative, since it focuses on economic, social and environmental aspects. Production of steel also produces emissions to air and water, and Nordic Ecolabelling wishes to limit this by requiring that the emissions are within the BAT-AEL values specified in the BREF documents. The requirement can also be met if the steel comes from a manufacturer who has adopted new technologies that significantly reduce the climate impact from production. The technologies are like those stated in the EU's technical annex to the taxonomy report.<sup>19</sup>

Nordic Ecolabelling do not set requirements for steel rebars as the consultation has clearly shown that these are almost always made of high proportions of recycled steel. The work with documenting the recycled content and addressing the issues of traceability are not considered to be reasonable when the environmental benefit that can be achieved is limited. Therefore, this requirement is only activated when large amounts of steel is used for applications where more climate friendly alternatives (such as wood) are available, in façade and load bearing systems. Roof panels are not covered by the requirement.

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<sup>16</sup> <https://www.stalforbund.no/miljo/>

<sup>17</sup> <http://www.eurofer.org/About%20us/About%20Steel/EuropeanSteelMap.fhtml>

<sup>18</sup> <https://www.worldsteel.org/en/dam/jcr:96d7a585-e6b2-4d63-b943-4cd9ab621a91/World%2520Steel%2520in%2520Figures%25202019.pdf>

<sup>19</sup> EU technical expert group on sustainable finance, Taxonomy Report: Technical Annex, March 2020:

[https://ec.europa.eu/info/sites/info/files/business\\_economy\\_euro/banking\\_and\\_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes\\_en.pdf](https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf)

## 09 Aluminium production

The requirement applies to the following construction materials/building parts:

- Façade panels in aluminium > 20% of the façade area (excluding window/door area)
- Profiles for windows and doors in aluminium (external cladding of outer wood components for the sole purpose of weather proofing is exempted). A Nordic Swan Ecolabel window, patio door or exterior door will fulfil the requirement and must only verify the requirement with the product name and licence number.
- Aluminium profiles in glass facade systems when the system covers more than 20% of the façade area (excluding window/door area)

*Mouldings around doors and windows are exempt from the requirement.*

*Skylights and roof domes regulated by product standard EN 1873 and windows and exterior doors that are resistant to fire pursuant to standard EN 16034 are not included in the requirement.*

**The requirement can be met by documenting alternative A or B:**

### A) High proportion recycled aluminium

A minimum of 75% by weight of aluminium must be recycled\*.

However, profiles for windows and doors must minimum contain 40% recycled aluminium.

*\*Recycled is defined as both pre- and post-consumed, cf. definition in ISO 14021.*

The requirement can be verified either by:

- A signed agreement between the producer/supplier of aluminium and the applicant stating that the requirement is met. The declaration from the supplier of aluminium can be based on purchase records/average data from several aluminium suppliers, or
- eBVD or EPD based on product-specific data or data from the aluminium producer's own production that specifically states the content of recycled aluminium in the product, or
- Valid Hydro Circal certificate.

Signed agreement as described above, or

eBVD or EPD as described above, or

Valid Hydro Circal certificate.

### B) Primary aluminium production

The requirement can be met by one of the four alternatives (1-4) below.

The requirement can be verified using either direct traceability through the supply chain or mass balance approach<sup>20</sup>.

### ***1. Aluminium production – active sustainability strategy***

Aluminium originates from a primary aluminium producer with an active sustainability strategy focusing on reducing energy consumption and greenhouse gas emissions. The strategy for reducing energy consumption and greenhouse gas emissions shall be quantitative and time-based and must be determined by the company management.

- ☒ Enclose latest sustainability strategy report or equivalent documentation from the producer of primary aluminium showing fulfilment of the requirement. The producer of primary aluminium can also present specific targets from annual business report with reference to specific numbers and assumptions. Average numbers from the producer of primary aluminium with several steel melting plants is accepted.
- ☒ Information on type of traceability used to document the requirement.

### ***2. Aluminium production – low direct climate affecting emissions***

Aluminium originates from a primary aluminium producer whose direct climate-affecting emissions from primary aluminium production does not exceed 1,5 tonnes of CO<sub>2e</sub>/ton of aluminium produced.

- ☒ Declaration that the requirement is met, as well as calculation and indication of direct emissions in tonnes of CO<sub>2e</sub>/ton of aluminium produced.
- ☒ Information on type of traceability used to document the requirement.

### ***3. Aluminium production – low electricity consumption for electrolysis***

Aluminium originates from a primary aluminium producer whose electricity consumption for electrolysis does not exceed 15.3 MWh/ton produced aluminium.

- ☒ Declaration that the requirement is met, as well as calculation and indication of electricity consumption in MWh/ton produced aluminium.
- ☒ Information on type of traceability used to document the requirement.

### ***4. Aluminium production – ASI certified site***

A minimum of 50% by weight of aluminium originates from a ASI Performance standard<sup>21</sup> certified production site.

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<sup>20</sup> In case of several potential aluminium producers, the supplier of the metal components can verify the requirement by using a mass balance approach if there is an account documenting the annual volumes purchased from the individual aluminium producers. The volumes must correspond to volumes sold to the applicant (e.g., cannot sell a larger volume than the corresponding quantity purchased from the individual aluminium producers)

<sup>21</sup> <https://aluminium-stewardship.org/asi-standards/asi-performance-standard> (visited November 2022)

- ☒ Enclose valid ASI Performance certificate from the primary aluminium producer.
- ☒ Information from the supplier/manufacturer of the constituent aluminium part about which aluminium parts are from certified aluminium production (purchase records).
- ☒ Information from the supplier/manufacturer of the constituent aluminium parts on type of traceability used to document the requirement.
- ☒ Documentation from the applicant that the requirement for share of purchased aluminium from certified aluminium producers is fulfilled – e.g., invoices or other documentation from suppliers.

## Background

Using recycled metal can reduce the environmental impact and provides a significant climate benefit. Among other things, this is highlighted in the taxonomy work in the EU.<sup>22</sup> Nordic Ecolabelling is aware that the availability of recycled metal and traceability can be a challenge. Traceability in the production chain is also a value in itself, and is important for several aspects, e.g., it provides opportunities to select suppliers based on environmental work, working conditions, quality etc.

For aluminium, Hydro has launched its own traceability certification with a minimum of 75% recycled Al, Hydro Circal. Currently, there is a small plant in Luxembourg that can supply this, but from 2020, the Azuqueca plant in Spain will be able to supply Hydro Circal with a production capacity of 25,000 tonnes. The industry average for EU-produced Al is approx. 50% recycled, while for Al outside the EU it is approx. 40%. The major environmental benefit comes from the use of post-consumer recycled aluminium. Nordic Ecolabelling therefore requires that a certain proportion of the recycled material must be post-consumer.

In this version of the criteria, Nordic Ecolabelling has for the first time introduced requirements concerning primary aluminium production. Requirements can therefore be met either by including a high proportion of recycled material, or by fulfilling several requirements for primary aluminium production. The requirement model is based on an obligatory requirement for the producer to have an energy and greenhouse gas calculation with defined reduction targets.

Certification by the Aluminium Stewardship Initiative (ASI) is something that Nordic Ecolabelling sees as a positive initiative, as it focuses on economic, social and environmental aspects. For aluminium, the requirement can also be fulfilled by documenting direct emissions of greenhouse gases and energy efficiency in the electrolysis process, where the limits are based on values stated in the EU Taxonomy report. Direct emissions are to be calculated according to the

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<sup>22</sup> Taxonomy report, technical annex, EU technical expert group on sustainable finance, March 2020.

methodology used for EU-ETS benchmarks. Please note that these values may change based on the outcome of the EU Taxonomy work.

The requirement is limited to handling the most significant parts of aluminium in buildings; façade panels, profiles for windows and doors in aluminium (external cladding of outer wood components for the sole purpose of weather proofing is exempted) and aluminium profiles in glass facade systems when the system covers more than 20% of the façade area (excluding windows/doors).

Direct reuse of aluminium is difficult due to properties of the material and is therefore not included as an option for documentation,

In this criteria document, windows and exterior doors are defined as:

- Windows and exterior doors between the interior climate and exterior climate, according to the EN 14351-1 standard: 2006.
- Other types of exterior doors such as entry hall doors/apartment doors, exterior corridor doors, window-walls in school and office buildings, warm storage room doors, cold storage room doors etc.

The recycled share is unchanged from generation 3 of the criteria as Nordic Ecolabelling has experienced that fulfilling and documenting this level is still challenging for the producers. The single most significant contribution to a window's overall environmental impact is related to the window's energy utilisation during operation of the building. This is dealt with in the requirement of the building's energy use, O3.

#### P9 Construction site fuel restrictions

Points will be given when grid electricity, district heating, hydrogen, or bio-based fuels\* (liquid, gaseous or solid) is used for heating on the construction site within the timeframe from the start of foundation work to finished interior work. Heating for concrete setting, curing, and drying, thawing, frost protection and heating of construction site cabins is included in the requirement.

Interior drying shall not begin until the building envelope is sealed. Temporary sealing is accepted.

Points are given in relation to the share of heating provided by grid electricity, district heating, hydrogen, or biofuels\*:

- >50% of total kWh: 1 point
- >90% of total kWh: 2 points

*This requirement includes activities on the construction site. Prefabrication in e.g. module factories is not regarded.*

*\*The use of biodiesel will not be given points in Finland due to the content of PFAD.*

- A description of the energy sources used for heating at the construction site.

- ☒ Total amount of heating (kWh) used on the construction site, share of heating provided by electricity, district heating, hydrogen, or biofuels.
- ☒ A project plan with time schedule showing that interior heating of the building starts after the building envelope is sealed.

### P10 Construction site machinery

During the timeframe from the start of foundation work to finished interior work, the use of construction machines and other heavy equipment powered by grid electricity, hydrogen or biofuels gives a maximum of 2 points, according to Table 9.

**Table 9 Fossil- or emission-free hours worked by construction machines/heavy equipment**

Fossil- or emission-free hours worked by construction machines/heavy equipment	
<b>1 point</b>	A minimum of 50% of the hours worked on the construction site by construction machines* are fossil-free**.
<b>1 point</b>	≥30% of the hours worked on the construction site by construction machines* are powered by grid electricity or hydrogen.
<b>2 points</b>	≥70% of the hours worked on the construction site by construction machines* are powered by grid electricity or hydrogen.

*\*Construction machines covered by this requirement are machines/heavy equipment ≥1 ton used on the construction site.*

*\*\* Fossil-free, i.e., here defined as: bio-based fuels (HVO, FAME/RME, ED95, etc.), hydrogen and grid electricity. There's no requirement on the types of energy from which the grid electricity or hydrogen are produced. The use of biodiesel will not be given points in Finland due to the content of PFAD.*

*Transport of materials, machinery, and persons to and from the construction site, as well as waste handling, waste treatment and material production, are not included in this requirement.*

- ☒ A list of all construction machines/heavy equipment ≥1 ton by brand and type. The list must provide information on the fuel/energy type used and worked hours for all machines.

### Background P9 and P10

The requirements for energy use on the construction site apply only to emissions on the construction site and do not cover the energy sources earlier in the value chain, such as the energy sources for the district heating or for producing the electricity or hydrogen. The focus in these requirements is on heating and construction machinery/heavy equipment. Heating includes heating for concrete setting, facade heating and interior heating. Transport of materials, machinery, and people to and from the construction site, as well as waste handling, waste treatment and material production, are not included in this requirement.

Activities on construction sites contribute to greenhouse gas emissions due to the vast use of fossil fuels. In addition, this leads to emissions of nitrogen oxide and particulate matter pollution. The annual emissions from construction sites in Norway are around 340,000 tonnes CO<sub>2e</sub> and 4,700 tonnes NO<sub>x</sub>. Emissions are produced by construction machines and vehicles at the building sites, and by burning fuel for heating. Diesel is the main energy source for construction machines and transport, while both natural gas and mineral oil are used for heating. From 2022, the Norwegian Government will ban the use of mineral oil for heating of construction sites. It is expected that this ban will reduce

greenhouse gas emissions by around 80,000 tonnes per year by 2030. From 2025, the goal is that all Norwegian construction sites will be fossil-free. There are similar goals in the other Nordic countries. Through the C40 Clean Construction Forum, Oslo, Copenhagen, and Stockholm have committed to take the lead in creating a global market for low-emission construction materials and zero-emission machinery (October 2019).

Options for fuels that are fossil-free on the construction site are bio-based fuels (e.g., HVO/Hydrogenated Vegetable Oil, FAME/RME/Rapeseed Methyl Ester and ED95/ethanol-based biofuel), district heating, hydrogen and electricity. An even more ambitious goal would be zero-emission construction sites. These are construction sites where energy use does not contribute to any local emissions of CO<sub>2e</sub> or NO<sub>x</sub>. Alternatives for heating that are emission-free on the construction site are district heating, electricity or other energy sources that do not lead to local emissions of CO<sub>2e</sub> or NO<sub>x</sub>, such as hydrogen used in fuel cells. For construction machines and transport, emission-free alternatives are battery electric machines and vehicles, or cable electric machines. Hydrogen is used for fuel cell systems that produce heat and off-grid electricity as an alternative to diesel generators. When Hydrogen is instead combusted, there will be emissions of NO<sub>x</sub> just like when bio or fossil fuels are combusted. Nordic Ecolabelling awards both the use of electricity and hydrogen.

Examples of construction machines include excavators, loaders, haulers, drilling rigs, bulldozers, road rollers, graders, dumpers, telescopic handlers, pile drivers, soil stabilisers, compactors, asphalt pavers, cranes, and lifts.

### P11 Bicycle transport

A maximum of 2 points are given when one or more of the following measures are taken to promote residential or occupational bicycle transportation.

**Table 10 Possible points for residential buildings**

Residential buildings	
An indoor bicycle workshop at least equipped with a workbench or rack, a pump and basic tools is available to all residents. Alternatively a designated bicycle wash station gives	1 point
At least 1.5 bicycle parking spaces per residential unit are provided and equipped with access to frame locks. Bicycle stands alone are not sufficient to achieve points.	1 point
At least 50% of bicycle parking is weather protected. Minimum 1.5 bicycle parking spaces per residential unit.	1 point
Communal cargo bike(s) with designated weather protected parking are available for the residents.	1 point
Weather protected bicycle parking for cargo bikes and bicycle trailers is available. Minimum 1 per 10 residential units.	1 point

**Table 11 Possible points for educational buildings**

Educational buildings	
One bicycle parking space per 4 students and teachers is provided and equipped with access to frame locks. Bicycle stands alone are not sufficient to achieve points.	1 point
At least 50% of bicycle parking is weather protected. Minimum number of parking spaces according to alternative 1 must be fulfilled	1 point

Preschools: Weather protected bicycle parking for cargo bikes and bicycle trailers is available. Minimum 1 parking space per 20 children.	1 point
Facility for charging electric bikes is available as part of the bicycle parking facilities.	1 point

**Table 12 Possible points for office buildings**

Office buildings	
One bicycle parking space per 10 employees is provided in a locked room.	1 point
At least 50% of bicycle parking is weather protected. Minimum one bicycle parking space per 10 employees must be fulfilled.	1 point
Facility for charging electric bikes is available as part of the bicycle parking facilities.	1 point
Bikes are available for the employees in the office building for local transport. A minimum of 1 bike per 50 employees must be available.	1 point

- ☒ Description of the specific measures in relation to the requirement.

## Background

Nordic Ecolabelling rewards measures to simplify and encourage the use of bicycles as a means of transport. This applies in relation to all building types.

Charging points for electric cars, are not rewarded since this is relatively strictly regulated by the authorities. The environmental benefit of such a requirement would therefore be limited.

Public transport is also considered a green alternative, but this is outside the scope of the requirement because it is beyond the control and influence of the Nordic Ecolabel.

## 8 Resource efficiency and circular economy

### O10 Construction waste management

At least 70% by weight of the non-hazardous construction waste generated on the construction site\*, must be prepared for reuse, recycling and other material recovery including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy and the EU Construction and Demolition Waste Management Protocol.

The percentage excludes naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC.

Untreated wood, wood treated with hazardous substances (wood classified as hazardous waste) and wood treated with non-hazardous substances, must always be sorted separately.

Unsorted/mixed construction waste cannot be counted as recycling/material recovery unless it is documented to be separated subsequently by the waste contractor.

Demolition waste must not be accounted for.



The waste management plan for the project must be sent to Nordic Ecolabelling before the construction of the building begins. The plan must contain information about waste fractions, chosen waste management company and the receivers\*\* waste management companies intended treatment form of the fractions. The plan must be made in accordance with the EU Construction and Demolition Waste Management Protocol.

After finished project, a report with the following information must be sent to Nordic Ecolabelling:

1. The total amount of construction waste produced at the construction site.
2. The amounts of all waste fractions, the company name of the respective receiver(s)\*\* and their intended treatment form.
3. Calculation of material recovery degree based on the bullets above.

*\* If parts of the building are constructed as a module/prefabricated element, the waste generated in the factory must in addition comply with the requirement on a yearly basis.*

*\*\* Receivers can be both treatment facilities that carry out material recovery or receivers of waste fractions that sort and distribute it to relevant treatment facilities . A company that only transports construction waste is not regarded as a receiver.*

- The waste management plan for the project must be delivered before the construction starts at the construction site.
- Report from the waste management company in accordance with the bullets 1-3 in the requirement.

## **Background O10 and P12**

EU waste directives and national plans have identified the material recovery of construction waste for recycling or reuse as a core issue in the transition to a circular economy. This obligatory requirement for all ecolabelled buildings will ensure that construction companies contribute towards this goal, delivering construction waste that is prepared for reuse, recycling, and other material recovery to the established recovery systems in each country.

The delivery of the waste management plan before the start of construction will help identify any possible problems with sorting and handling in the building project. In addition, it will ensure that the waste management is in alignment with the situation at the construction site and the local possibilities for handling of the waste. Any issues can be addressed before start of the construction, while in later phases of the project it might be too late.

This requirement is in alignment with the level in the EU Taxonomy's "Do No Significant Harm" criteria that require at least 70% of non-hazardous waste to be prepared for reuse, recycling, and other material recovery. It should be noted that demolition waste is not accounted for. For details on the EU Taxonomy please refer to the section on the EU Taxonomy in this criterion.

Both productions of modules and prefabricated elements must account for and fulfil the requirement.

The requirement P12 aims at rewarding when even higher level than 70% are achieved.

### P12 Construction waste optimisation

Points are granted when more than 75% by weight of the non-hazardous construction waste generated on the construction site\*, is prepared for reuse, recycling, and other material recovery according to O10.

The following levels are required to achieve points:

**Table 13 Requirement for optimized preparation of waste according to O10**

Waste prepared according to O12	Points
75% weight	1
80% weight	2
85% weight	3

- ☒ Report(s) from the waste management company showing the amounts of the waste fractions collected in relation to the total volume of the project's construction waste. The intended treatment form of the waste fractions must be stated. Both construction site and module/prefabricated element factories must be accounted for.

### P13 Construction waste reduction

Minimisation of the construction waste at the building site gives points according to table 14 below.

The entire construction phase from construction of the base plate to the finished building is included.

**Table 14 Requirement for minimisation of construction waste**

Waste per square meter floor area	Points
≤30 kg/m <sup>2</sup>	1
≤25 kg/m <sup>2</sup>	2
≤20 kg/m <sup>2</sup>	3

*Floor area is calculated as brutto area (BTA).*

*Naturally occurring material defined in EU waste category 17 05 04 – soil and stones and total hazardous waste are excluded when calculating the total amount of waste.*

*If parts of the building have been constructed as modules/prefabricated elements in a factory facility, yearly based data from the factory must be combined with the waste data from the building site. The allocation must be done based on weight of the building parts.*

- ☒ Report from the waste management company showing the total amount of construction waste from the construction site and/or module factory.
- ☒ Calculation of the construction waste generated per square metre.

## Background

The prevention of waste is the most desirable action in the waste hierarchy. The EU's circular economy action plan also mentions this as a core principle to "ensure less waste". Prevention of waste not only has an environmental benefit but also leads to reduced costs for the construction process. The Nordic Swan Ecolabel encourages projects to work actively in reducing the total amount of waste produced.

Internal data from Nordic Swan Ecolabel projects shows that the average waste generation still currently lies well above 30 kg waste/m<sup>2</sup> gross area. This indicates that the construction companies should be further motivated to reduce generation of waste, greatly helping to minimise the environmental impact of the sector.

### P14 Producer take-back systems

Points are given when a take-back systems from producer of building products/materials is used in the construction phase of the building. The take-back system must ensure that used or excess materials are either reused or recycled by the producer.

One point is given for take back systems covering minimum one (1) category/type of construction material.

Two points are given for take back systems covering minimum three (3) categories/types of construction materials.

*Take back systems can be organized directly by the producer or by a waste management company.*

*Take back systems covering untreated wood for temporary safety constructions is also rewarded. Both external services and internal reuse within the company are accepted.*

*Packaging material is not covered by the requirement.*

- An agreement with the supplier/producer or documentation with specific details showing how the take-back system is implemented at the construction site or module production facility.
- Report/invoice from the receiver of the material handled in the take-back system.

## Background

Nordic Ecolabelling wishes to encourage the usage of producer take-back systems for products/materials that can be handled better outside the existing waste handling systems. A take-back system is an efficient way to avoid generating waste, as excess material can be used in the production of a new product. The waste from the specific material/product is gathered separately from the waste collection system at the construction site and is sent back to the producer or supplier. This means that the materials will be handled by the producers, with their specific knowledge on how to reuse or recycle the material in question most effectively.

The requirement can in principle cover all relevant construction materials.

Sorted packaging materials (cardboard, plastic wrapping etc.) will normally be recycled within the existing waste sorting/handling systems. Nordic Ecolabelling do not see an extra environmental benefit by handling these fractions separate from the existing systems.

Wooden pallets are normally reused from the construction sites and Nordic Ecolabelling do not see an extra environmental benefit by handling these fractions separate from the existing systems.

Incineration and composting is not rewarded in this requirement.

### O11 Waste sorting inside the building

Facilities for waste sorting must be available in the Nordic Swan Ecolabelled building. The number of sorting vessels is stated for each building type below.

#### Residential buildings

- Sorting vessels for minimum four fractions in all residential units\*.
- Communal kitchens: Sorting vessels for minimum four fractions must be installed in or in the vicinity of the kitchen (e.g., in homes for the elderly and student housing)

\* *Kitchenettes without cooking facilities such as oven and stove (e.g., homes for the elderly) are exempted from the requirement.*

#### Educational buildings

- Sorting vessels for minimum four fractions must be installed in or in the vicinity of the main kitchen and in all other permanent kitchen facilities.
- Sorting vessels for minimum two fractions must be installed in all classrooms and common rooms.

#### Office buildings

- Sorting vessels for minimum four fractions must be installed in canteen facilities.
- Sorting vessels for minimum two fractions must be installed in all kitchenettes.

☒ Description of sorting vessels for waste sorting. Documentation can be description, pictures, or datasheet.

### Background

To support extensive recycling of waste, a Nordic Swan Ecolabel building must be equipped with vessels for sorting at source. The number of fractions in residential units is set at four sorting fractions, which could be: residual waste, food waste, plastic, metal, glass or paper. The last four fractions, apart from the residual and food waste, are also the minimum fractions required by the revised European Directive 2008/98/EC on waste. However, Nordic Ecolabelling will not set requirements concerning which specific fractions must be sorted, due to

variations in the collection systems of the countries and municipalities. Some fractions are often collected mixed and then sorted afterwards.

In educational buildings, every room with kitchen facilities, where appliances are permanently installed for cooking and preparing meals, should have four fractions for sorting of waste. That includes small kitchens attached to sports facilities.

In elderly homes every room with kitchen facilities, where appliances are permanently installed for cooking and preparing meals, should have four fractions for sorting of waste. Tea kitchens are exempted.

## O12 Hazardous substances in reused construction products and materials

When reused construction products, fittings and materials are used, a risk analysis documenting the presence of hazardous substances must be conducted by an expert\*. Hazardous substances must be evaluated and documented according to all relevant national legislation and Appendix 5.

The risk analysis must, as a minimum, be based on the age of the building/construction, the renovation history of the building, the durability / lifetime of the materials, the state and cleansing of the material and knowledge and experience with the materials used at the time the building of origin was first constructed and renovated. This includes content of problematic substances in the material itself and in surrounding materials if substances found have migratory properties.

If the expert identifies any risk of undesirable substances (according to Appendix 5 and relevant national legislation), analyses must be performed by an accredited laboratory to verify the content in relation to relevant threshold limits in Appendix 5 and national legislation. Nordic Ecolabelling always have the right to require laboratory analysis for reused products.

The following materials are considered safe to use and are therefore exempt from further documentation in this requirement: Outdoor concrete tiles, untreated wood for outdoor purposes, untreated interior doors in wood (no glass or insulation), interior walls in glass without framing and untreated wooden floors.

Reused materials must be documented in the logbook (O13).

*\* The expert conducting the risk analysis must be trained in documenting hazardous substances and have at least 3 years' experience in the field of environmental mapping/surveys of buildings. This can be either an internal or an external person.*

- Overview of the reused materials used.
- Risk analysis from expert that documents the presence of undesirable substances listed in Appendix 5 and relevant national legislation.
- Where relevant, an analysis report from an accredited laboratory on the substances listed in Appendix 5 and relevant national legislation.

## Background

Reusing products instead of manufacturing new ones is a fundamental concept in a circular economy. The requirement ensures that no harmful substances are introduced in new buildings from old materials.

A risk analysis of the materials made by an expert must be performed as an assessment based on the age of the building/construction, the renovation history of the building, and the state and cleansing of the material can verify any risks in relation to the material in question. In addition, knowledge and experience with the materials used at the time the building of origin was first constructed and renovated must be included in the assessment. This includes content of problematic substances in the material itself and in surrounding materials if substances found have migratory properties.

When an expert cannot verify the lack of harmful substances in reused products, it is necessary to perform a laboratory analysis to ensure that any contaminated products will be taken out of the circular loop.

Appendix 6 specifies relevant substances that must be investigated for. The threshold limits correspond with the strictest levels required in Nordic Swan Ecolabel building renovations or generation 3 of these criteria. In addition, any national threshold limits must be fulfilled.

The requirement contains a list of materials that are considered safe to use and are therefore exempt from further documentation in this requirement. The list is based in a project undertaken in partnership by IVL (Swedish Environmental Research Institute), Kompanjonen, Folksam and Vasakronan.

### P15 Reused construction products and materials

The following product categories of reused products give points. The minimum share of the total demand that must be covered by reused products to obtain points is shown in table below. Using spills or leftovers from new materials is not considered reuse. All materials/products must comply with requirement O12.

Maximum 4 points can be achieved.

Reused materials must be documented in the logbook (O13).

**Table 15 Product categories of reused products**

Product category	Minimum share of total demand	Points
Facade material (Wood, bricks, steel, aluminium, glass etc).	25%	2
	50%	3
Roof material	25%	2
	50%	3
Inner walls (Timber, bricks, aerated concrete etc.)	25%	2
	50%	3
Floor slab/ floor framing (Timber, concrete elements, steel beams)	25%	2
	50%	3
Load-bearing walls	25%	2

(Timber, bricks, concrete elements etc.)	50%	3
Load-bearing roof structures (Timber, concrete elements etc.)	25%	2
	50%	3
Doors	50%	1
	75%	2
Flooring	25%	2
	50%	3
Lighting sources	50%	1
	75%	2
Suspended ceiling	50%	1
	75%	2
Untreated construction wood/timber for supplementary buildings	50%	1
	75%	2
Untreated construction wood/timber for temporary safety constructions	50%	1
	75%	2
Outdoor decking (stone, wood, tiles etc)	50%	1
	75%	2
Capillary break layer	50% of total need for sand/ aggregates must be taken from another construction site where it is surplus.	1
Concrete foundation	30% of total need for aggregates must be crushed concrete	1
<b>Maximum points</b>		<b>4</b>

*On request, Nordic Ecolabelling will assess any other products and materials that are suggested for inclusion on a project basis.*

- Calculation of the share of reused product in the relevant product category.
- Documentation for the purchase or acquisition of reused products.

## Background

Creating closed material loops is one of the core principles of a circular economy and Nordic Ecolabelling actively supports this by creating demand for reused products.

Substituting virgin materials with reused products is important when trying to lower the total impact that a new building has on the climate and the environment. Using the resources already in circulation and avoiding the production of new materials in the chosen categories has a great benefit for the environment.

Nordic Ecolabelling can approve other products and materials for a specific project if there is enough information showing that the products can be safely reused/used without posing a health risk for the users of the building.

Aggregates from crushed concrete can make up maximum 30% of the aggregates according to EN 206:2014 + A2:2021.

## P16 Insulating materials made from renewable sources

Points are given when a minimum of 90% of the total need for insulation in a construction part is covered by an insulation product with minimum 90% renewable material\* see table 16. Maximum 2 points can be achieved.

**Table 16 Points for the use of renewable insulation**

Construction part	Points
Outer walls	1
Roof	1
Foundation	1
<b>Maximum points</b>	<b>2</b>

\* Paper wool insulation is considered as renewable material.

All materials must comply with the requirements in O25.

Wood fibre must also comply with O29 and O30.

- Product sheet or other documentation from the manufacturer that states the share of renewable material in the insulation product.
- Drawings or other documentation that verifies the share of renewable insulation products used in the chosen construction part.

## Background

Insulation is present in large quantities in buildings. While it ensures lower energy demand for the final building, energy is also used to produce insulation materials. Nordic Ecolabelling wishes to promote materials that are based on renewable sources. Wood fibre insulation is rewarded, as it is based on renewable sources. It must furthermore fulfil the requirement on certified wood to ensure material from sustainable sources. Paper wool insulation is based on recycled material but originates from wood and is therefore also rewarded.

All materials must comply with O25.

## P17 Renewable carcass, facade or inner walls

For buildings with timber / renewable construction in the carcass, facade or loadbearing walls, the following points are given:

**Table 17 Points for the use of renewable carcass, facade or inner walls**

Construction part	Minimum share (weight or volume)	Points
Floor framing	90%	1
Load-bearing walls	90%	1
Load-bearing roof structures	90%	1
Facade area (excluding windows and doors)	50%	1
<b>Maximum points</b>		<b>2</b>

The requirement does not apply to supplementary buildings. Maximum 2 points can be achieved.

WPC (Wood polymer composite) will not be given points.

- Description/drawings of the relevant building component.



- ☒ Calculation of timber/renewable material in relevant building component.

## Background

Greater use of renewable materials generally gives a lower resource, energy and climate impact from the building structure. Studies such as “Life Cycle Assessment of Different Building Systems: The Wälludden Case Study” and “Carbon, Fossil Fuel and Biodiversity Mitigation with Wood and Forests” show that timber constructions have a lower climate footprint compared to concrete constructions. The Nordic Swan Ecolabel wishes to steer towards sustainable renewable material and to minimise the climate impact of buildings. Therefore, timber in the main structure of the building is rewarded.

If reused wood is used it can be rewarded both here and in P15.

## P18 Design for disassembly and adaptability

Two points are available, one for strategy and one for a DfD/A plan.

### Strategy

One point is given to projects where the applicant has implemented an internal strategy to ensure that design for disassembly and adaptability is always considered in the design process. The strategy must at least include:

- a) Roles and responsibilities for DfD/A within the organisation.
- b) Guidelines for identification of connections that can be reversible.
- c) Guidelines for choice of materials and technologies.
- d) Information structure for drawings, descriptions and instructions regarding disassembly of components and possibilities for adaptation of the building. It must be specified how the information is handed over to the building owner.

*Reference can be made to ISO 20887, LEVEL(s) indicator 2.3 or other relevant standards or methodologies for the disassemblability or adaptability of buildings.*

### Design for disassembly and adaptability in the building

One point is given for a plan for design for disassembly and adaptability of the building, in accordance with "7.1.4: Transition to a circular economy" in the EU taxonomy.

The plan must verify how the building designs and construction techniques support circularity. In particular it must be demonstrated, with reference to ISO 20887:2020 or other standards for assessing the disassembly or adaptability of buildings, how they are designed to be more resource efficient, adaptable, flexible and dismantlable to enable reuse and recycling. A relevant set of measures must be implemented to verify that the building is better compared to the average new built building.

- ☒ Strategy within design for disassembly and adaptability, covering a) to d).
- ☒ Plan for design for disassembly and adaptability of the building , description of the measures implemented.

## Background

Design for disassembly/adaptability is an important concept in the circular economy and is also encouraged by Nordic Ecolabelling. Reference should be made to ISO 20887:2020 – Design for disassembly and adaptability.

The aim of the DfDA is to be able to deconstruct a building through planning and designing, leading to easy recovery of components, products and materials without material loss and generation of waste. Those components can then be reused in another construction, or the materials can be recycled without loss of quality. This can also facilitate the flexibility of a building, in changing uses by dismantling and replacing a part of it. This is defined as adaptability of the building and the same principles as in disassembly are applied.

The long-term goal of this principle is for the materials to always stay in closed loops and not end up in a state where they cannot be recovered and reused, but also that the building will stay in use as long as possible, adapting to new needs.

The requirement is based closely on the requirement in the EU taxonomy. Nordic Ecolabelling will not interpret what level of documentation is necessary to fulfil the EU Taxonomy. When documenting the requirement, the applicant should focus on having a plan that covers all the relevant parameters in the building: How the building designs and construction techniques support circularity, disassembly or adaptability of buildings, how buildings are designed to be more resource efficient, adaptable, flexible and dismantlable to enable reuse and recycling.

## 9 Chemical products, construction products, construction goods and materials

This chapter consists of three sections of requirements:

1. Product list and logbook
2. Chemical products
3. Construction products, goods and materials.

Reference is made to the individual requirements, the section "Definitions" and the section "What is subject to the requirements?" for an explanation of what is included in the requirements.

Nordic Swan Ecolabel products automatically fulfil the requirements in this chapter.

## 9.1 Product information and logbook

### O13 Logbook

The Nordic Swan Ecolabel building project must have a digital logbook (e.g., PDF, Word or Excel) that includes all the construction products, goods, materials and chemical products used in the construction of the project. Reused products must also be registered in the logbook.

The logbook may be created using a verified third-party logbook service after approval by Nordic Ecolabelling.

The logbook must as a minimum provide the following information:

- Product name
- Product type
- Name of producer
- The location of the product in the building(s)\*

Before the construction begins the logbook must be initiated and account for materials and products used in the initial stages\*\* of the building project. The logbook must always be updated with materials and products according to the current state of the construction. The final version of the logbook must be handed in when the building is handed over. There must be routines in place to ensure that the digital logbook is accessible to the owner of the building and to Nordic Ecolabelling.

*Technical instruments and electrical installations should not be described in detail but must be represented on a system level. Products subject to general exemptions, as described in the section "What is subject to the requirements", are not necessary to include in the logbook.*

*The GTIN number or the ID number in a national product registry should be included in the information if available.*

*\* Minimum level of description: ceiling, walls and floor, building's roof, facade, cellar, stairwell, slab, building's frame, terrace, bathroom, kitchen, balconies, garage, sports halls, garden, entrance hall, technical installation rooms, waste sorting room, laundry room, lift shaft.*

*\*\* The initial stages are normally considered to be 'construction of the foundation' and 'sealing of the building envelope'. Depending on the size of the project, the construction techniques and whether parts of the building is constructed in a module factory the specific phases included must be approved by Nordic Ecolabelling. As a minimum the materials for the construction of the foundation must always be accounted for.*

- The digital logbook before the construction begins covering the initial stages of the project.
- Procedure for updating the logbook during the construction period (reference can be made to O40).
- The final digital logbook when the building is handed over.
- Description of how the logbook is made available to the building owner.

## Background

The purpose of a logbook is to act as an inventory of materials and products used today to ensure the best possible reusability or recyclability in the future. It is an important tool for the transition to a circular economy and for the concept of buildings as material banks. The logbook can also contribute to proper maintenance of the building during its life cycle and to the identification of hazardous substances prior to renovation and demolition.

To ensure that the logbook serves all the aforementioned purposes, it must include not only the names of products and a product description to report the content, but also where it is located in the building. The location can be stated on a uniform basis, like in other building-related documentation and drawings. This can be as detailed as possible but there is a minimum level of description based on the following definitions: ceiling, walls and floor, building's roof, facade, cellar, stairwell, slab, building's frame, terrace, balconies, garage, sports halls, garden, entrance hall, technical installation rooms, waste sorting room, laundry room, lift shaft.

In order to ensure compliance with the materials in this criterion the logbook must be dynamic and be updated according to the building process. Problematic products and materials, especially if discovered in the late stages of the project, can lead to measures that will be costly and will take time to undertake, even leading to the denial of certification. It is also a waste of resources and an environmental burden to replace materials and products already used in the construction. For those reasons, the logbook also offers a good basis of control, preventing unwanted situations and potential negative environmental and financial effects.

## 9.2 Chemical products

A chemical product is a substance or a mixture of two or more substances, in liquid, gaseous or solid form, which are used on a construction site or by a manufacturer of prefabricated building components.

Chemical products for both indoor and outdoor use are covered by the requirements. The requirements in the criteria document and accompanying appendices apply to all ingoing substances in the chemical product. Impurities are not regarded as ingoing substances and are exempt from the requirements. Ingoing substances and impurities are defined in the Definitions section.

For details on what is subject to the requirements, reference is made to the section "What is subject to the requirements?"

### O14 Classification of chemical products

Chemical products must not be classified according to Table 18.

**Table 18 Classification of the product**

Classification of chemical products CLP Regulation 1272/2008:		
Classification	Hazard class and category	Hazard code
Hazardous to the aquatic environment	Aquatic Acute 1	H400
	Aquatic Chronic 1	H410
	Aquatic Chronic 2	H411

Hazardous to the ozone layer	Ozone	H420
Acute toxicity	Acute Tox. 1 or 2	H300
	Acute Tox. 1 or 2	H310
	Acute Tox. 1 or 2	H330
	Acute Tox. 3	H301
	Acute Tox. 3	H311
	Acute Tox. 3	H331
Specific target organ toxicity: single or repeated exposure	STOT SE 1	H370
	STOT RE 1	H372
Carcinogenicity	Carc. 1A or 1B	H350
	Carc. 2	H351
Germ cell mutagenicity	Muta. 1A or 1B	H340
	Muta. 2	H341
Reproductive toxicity	Repr. 1A or 1B	H360
	Repr. 2	H361
	Lact.	H362

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

#### Exemptions:

- Chemical anchors classified H400, H410, and H411 due to dibenzoyl peroxide (CAS no. 94-36-0) are allowed.
- Hardener for acrylic floor coatings classified H400, H410, and H411 due to dibenzoyl peroxide (CAS no. 94-36-0) are allowed for use in professional kitchens. In Nordic countries with an authorisation system, the flooring contractor must be authorised.
- Biocide-containing wood primers classified H411 used for treatment of cut surfaces and end timbers are allowed.
- Naphtha-based primers and adhesives classified H411 for outdoor use.
- Naphtha-based adhesives classified H411 for cellular rubber insulation intended for cooling pipes and ventilation ducts indoors.
- FI: Classifications H351 and H362 for spray polyurethane foams used in element factories and at construction sites for sealing of windows when temperature is below 5 °C.

- Declaration from the manufacturer of the chemical product, in accordance with Appendix 6
- Safety data sheet in accordance with Annex II to REACH (Council Regulation (EC) no. 1907/2006) for all chemical products.

## Background

Nordic Ecolabelling seeks to ensure that the health and environmental effects of chemical products are as low as possible. The requirements therefore specify that products classified as environmentally hazardous, highly toxic, toxic,

carcinogenic, mutagenic or reprotoxic must not to be used to construct Nordic Swan Ecolabel buildings.

The requirement concerns the classification of the actual chemical products and not the individual compounds in the products, which are governed by subsequent requirements.

There are a few exemptions from the prohibited classifications of chemical products where the functionality requires substances for which unclassified alternatives are not available.

The commission regulation EU 2020/1149 will be implemented during the summer 2023 according to our information. For the PU products exempted this means that no additional working environment requirements will be implemented. This should be handled satisfactory according to this new legislation of 3 August 2020

### O15 CMR substances

Chemical products, used in the production of Nordic Swan Ecolabel buildings, must not contain any ingoing substances classified as carcinogenic, mutagenic or reprotoxic according to CLP Regulation 1272/2008, see Table 19 below.

**Table 19 Non-approved classifications of ingoing substances in chemical products according to CLP Regulation 1272/2008.**

Classification of ingoing substances CLP Regulation 1272/2008:		
Classification	Hazard class and category	Hazard code
Carcinogenicity	Carc. 1A or 1B	H350
	Carc. 2	H351
Germ cell mutagenicity	Muta. 1A or 1B	H340
	Muta. 2	H341
Reproductive toxicity	Repr. 1A or 1B	H360
	Repr. 2	H361
	Lact.	H362

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

Exemptions:

- Glyoxal (CAS no 107-22-2) classified H341  $\leq$  100 ppm (0.01% by weight) in the final product if the pH value in the final product is higher than pH 8.
- TiO<sub>2</sub> (CAS no 13463-67-7) classified H351 inhalation.
- Trimethylolpropane (CAS no 77-99-6) self-classified H361 up to  $\leq$  5000 ppm (0.5% by weight) in the final product.
- Dibutyltin (DBT) compounds and dioctyltin (DOT) compounds in sealing products  $\leq$  5000 ppm (0.5% by weight) in the final product.

- Zinc pyrithione (CAS no: 13463-41-7) classified as H360D, is exempted for a transition period until 2024-01-01 for tinting pastes/tinting systems.
  - Biocide-containing wood primers containing substances classified H361d used for treatment of cut surfaces and end timbers are allowed.
  - FI: 4,4'-methylenediphenyl diisocyanate, isomers and homologues (CAS no. 9016-87-9) classified as Carc. 2; H351 in spray polyurethane foams used in element factories and at construction site for sealing of windows when temperature is below 5 °C.
- Declaration from the manufacturer of the chemical product, in accordance with Appendix 6.
- Safety data sheet in accordance with Annex II to REACH (Council Regulation (EC) no. 1907/2006) for all chemical products.

## Background

In addition to the requirement concerning the classification of the chemical products, it is also required that chemical products cannot contain substances that are carcinogenic, mutagenic or reprotoxic (CMR substances cat 1A and 1B). Nor may chemical products contain substances that are suspected to be carcinogenic, mutagenic or reprotoxic (category 2).

Substances that may cause cancer, change genetic material or interfere with reproduction are prioritised substances within the EU's chemical legislation, due to their inherently dangerous properties. It is therefore of central importance to considerably reduce, and in the long term move away entirely from, the use of CMR substances.

There are a few exemptions from the prohibited classifications of chemical products where the functionality requires substances for which unclassified alternatives are not available.

The exemption for zinc pyrithione has been set to correspond with the time limitations in criteria for Nordic Swan ecolabelled paint.

The commission regulation EU 2020/1149 will be implemented during the summer 2023 according to our information. For the PU products exempted this means that no additional working environment requirements will be implemented. This should be handled satisfactory according to this new legislation.

### O16 Preservatives in indoor paint and indoor varnish

Only preservatives compliant with PT 6 (in-can) and PT 7 (dry-film) according to Regulation (EU)528/2012 (The Biocidal Products Regulation) can be used.

The amount of preservative/combination of preservatives is in indoor paint and indoor varnish is limited according to Table 20 and Table 21.

If the specific concentrations limit (SCL) is changed in accordance with CLP Regulation 1272/2008 Annex VI the limits below will also change accordingly.

For tinting systems, a worst-case calculation must be performed for the colour with most tinting paste and the base paint with highest content of preservative and isothiazolinone compounds.

**Table 20 Concentration limits for preservatives totally**

Product type	Preservatives total
Paints, varnishes, base paints with tinting paints etc. for indoor use.	900 ppm (0.09% w/w)
Wet room paint specifically	1600 ppm (0.16% w/w)

**Table 21 Concentration limits for specific compounds**

Preservatives	Concentration limit
Isothiazolinone compounds in total*	600 ppm (0.06% w/w)
BIT (CAS no. 2634-33-5)	500 ppm (0.05% w/w)
CIT/MIT (CAS no. 55965-84-9)	15 ppm (0.0015% w/w)
MIT (CAS no. 2682-20-4)	15 ppm (0.0015% w/w)
OIT (CAS no. 26530-20-1)	15 ppm (0.0015% w/w)

\*Note that dithio-2,2'-bis-benzmethylamide (DTBMA) is to be included in the total amount of isothiazolinones.

- ☒ Declaration from the manufacturer of the chemical product, in accordance with Appendix 6.

#### O17 Preservatives in other chemical products intended for indoor use

Only preservatives compliant with PT 6 (in-can) and PT 7 (dry-film) according to Regulation (EU)528/2012 (The Biocidal Products Regulation) can be used.

The amount of preservative/combination of preservatives in other chemical products for indoor use is limited according to Table 22.

If the specific concentrations limit (SCL) is changed in accordance with CLP Regulation 1272/2008 Annex VI the limits below will also change accordingly.

**Table 22 Concentration limits for preservatives in other chemical products for indoor use.**

Preservatives	Concentration limit
Isothiazolinone compounds in total*	600 ppm (0.06%w/w)
BIT (CAS no. 2634-33-5)	500 ppm (0.05% w/w)
CIT/MIT (CAS no. 55965-84-9)	15 ppm (0.0015% w/w)



MIT (CAS no. 2682-20-4)	15 ppm (0.0015% w/w)
OIT (CAS no. 26530-20-1)	15 ppm (0.0015% w/w)
IPBC(CAS no. 55406-53-6)	2000 ppm (0.2% w/w)
Bronopol (CAS no. 52-51-7)	500 ppm (0.05% w/w)

\* Note that dithio-2,2'-bis-benzmethylamide (DTBMA) is to be included in the total amount of isothiazolinones.

- Declaration from the manufacturer of the chemical product, in accordance with Appendix 6.

## Background

The requirement and the levels for highest permitted preservatives are partly harmonised with equivalent requirements in the criteria for Nordic Swan Ecolabel indoor paints and varnishes and for products for indoor use in the criteria for Nordic Swan Ecolabel chemical building products respectively. Levels for the highest permitted concentrations of the respective preservatives are partly the same as those that apply to Nordic Swan Ecolabel indoor paints and varnished. For all other chemical products for indoor use, the levels are the same as for Nordic Swan Ecolabel fillers, which is considered reasonable for a Nordic Swan Ecolabel building.

Updates for total preservatives and total isothiazolinone compounds in indoor paint and indoor varnish have been updated to 900 ppm and 600 ppm respectively, in accordance with corresponding updates for Nordic Swan Ecolabel indoor paints and varnishes.

### O18 Prohibited substances

The following substances must not be an ingoing substance in chemical products used in the production of Nordic Swan Ecolabel buildings:

- Substances categorised as Substances of Very High Concern (SVHC) and included on the EU Candidate List.
- Substances evaluated by the EU to be persistent, bioaccumulative, and toxic (PBT) or very persistent and very bioaccumulative (vPvB), in accordance with the criteria in Annex XIII of REACH.
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, II and III, see the following links.
  - <https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu>
  - <https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption>

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

A substance that is transferred to one of the corresponding sublists called “Substances no longer on list”, and no longer appears on any of Lists I–III, is no longer excluded. The exception is those substances on sublist II which were evaluated under a regulation or directive that does not have provisions for identifying EDs (e.g., the Cosmetics Regulation, etc.). For those substances, ED properties may still have been confirmed or suspected. Nordic Ecolabelling will evaluate the circumstances case-by-case, based on the background information indicated in sublist II.

In addition, the following individual substances and substance groups are prohibited or restricted. There may be an overlap between the substances listed below and substances categorised above.

- Short-chain chlorinated paraffins (C10-C13) and medium-chain chlorinated paraffins (C14-C17).
- Perfluoroalkyl and polyfluoroalkyl substances (PFASs)
- Alkylphenols, alkylphenol ethoxylates (APEO) and other alkylphenol derivatives (APD).
- Brominated flame retardants.
- Phthalates (Esters of phthalic acid (orthophthalic acid / phthalic acid /1,2- benzene dicarboxylic acid).
- Bisphenol A (CAS no. 80-05-7), bisphenol S (CAS no. 80-09-1) and bisphenol F(CAS no. 620-92-8).
- The heavy metals lead, cadmium, arsenic, chromium (VI), mercury and their compounds.
- Volatile aromatic hydrocarbons (VAH) >1% by weight.
- Organotin compounds.

Exemptions:

- Naphtha-based primers and adhesives classified H411 for outdoor use may contain up to 20% by weight of VAH.
- Dibutyltin (DBT) compounds and dioctyltin (DOT) compounds in sealing products ≤ 5000 ppm (0.5% by weight) in the final product.

- ☒ Declaration from the manufacturer of the chemical product, in accordance with Appendix 6.
- ☒ Safety data sheet in accordance with Annex II to REACH (Council Regulation (EC) no. 1907/2006) for all chemical products.

## Background

The list is based on the general principles from Nordic Ecolabelling regarding undesirable compounds in combination with corresponding requirements for Nordic Swan Ecolabel indoor paints and varnishes and chemical building products. A few exemptions are made when deemed necessary for the functioning of the chemical product.

### O19 Nanoparticles in chemical products

Nanomaterials/-particles (see Definitions) must not be added or be present in chemical products. Nanomaterials/-particles are defined according to the EU Commission Recommendation on the Definition of Nanomaterial (2022/C 229/01) (see Definitions).

The following are exempted from the requirement:

- Pigments\*
- Naturally occurring inorganic fillers\*\*
- Synthetic amorphous silica\*\*\*
- Unmodified Ground Calcium Carbonate (GCC) and unmodified precipitated Calcium Carbonate (PCC)
- Polymer dispersions

*\* This exemption does not apply to pigments added for other purposes than imparting colour. Nano-titanium dioxide is not considered to be a pigment and is therefore not exempted from the requirement.*

*\*\* This exemption applies to fillers covered by Annex V, item 7 of REACH.*

*\*\*\* This applies to unmodified synthetic amorphous silica. Chemically modified colloidal silica can be included in the products if the silica particles form aggregates in the final product. Any surface treatment of nanoparticles must fulfil requirement O14 (Classification of chemical products) and requirement O18 (Prohibited substances).*

- ☒ Declaration from the manufacturer of the chemical product, in accordance with Appendix 6.

## Background

There is still uncertainty related to how nanoparticles affect health and the environment.<sup>23</sup> Nordic Ecolabelling wishes to take a restrictive approach to the use of nanoparticles and the requirement is based on the environmental consequences when nanoparticles are released to the surroundings (indoor environment or the surrounding environment, seen over the entire life cycle). The requirement concerns chemical products that are used for the production of Nordic Swan Ecolabel buildings and is in line with equivalent requirements concerning Nordic Swan Ecolabel chemical building products.

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<sup>23</sup> European Council, Recommendation 2017 (2013), Provisional version, Nanotechnology: balancing benefits and risks to public health and the environment. Available on page: (21/5-13).

The definition of nanomaterials follows the European Commission's definition of nanoparticles<sup>24</sup>, see Definitions.

The requirement means that newer nanomaterials produced with the intention of containing nanoparticles must not be used. Examples of such nanoparticles are fullerenes, carbon nanotubes, nanosilver, nanocopper and nano-titanium dioxide.

### 9.3 Construction products – restricted material

#### O20 Halogen free cables

All heavy current cables must be documented as halogen-free according to EN 60754-1 and EN 60754-2.

*The requirement does not include data, telephone, and TV cables.*

*Mandatory requirement O25 must also be met.*

- ☒ Documentation from the manufacturer such as technical datasheet stating compliance with relevant standard.

#### Background

Nordic Ecolabel wishes to limit the use of PVC cables to reduce the harmful environmental and health risks related to them. This requirement focuses on cables that can affect the indoor environment due to the content of plasticisers.

The market for and use of PVC-free cables have been assessed and the products are widely available in all Nordic countries. Halogen-free cables are often put as a requirement for larger private investors and in public projects.

The cables must be documented as halogen-free according to EN 60754-1 or EN 60754-2. An obligatory requirement for sewage pipes and electrical cable conduits has not been introduced, since these products are made from hard PVC and can be handled in the existing waste system. Furthermore, electrical cable conduits, which are not made of PVC, contain varying concentrations of brominated flame retardants, which are also problematic in relation to the indoor environment.

This requirement applies to cables used both on site and in construction module factories. Cables that arrive at the construction site together with electric appliances, such as lifts, white goods, pumps, and fans are not subject to this requirement. Cables used on site, to connect the end of the appliance cable, must fulfil the requirement.

#### O21 Surface layers on floors, ceilings, walls, doors, and windows.

Doors, windows and interior surface layers on floors, ceilings and walls may not contain chlorinated plastics (PVC). This includes watertight layers, wall film, acoustic dampening foams and other products used directly underneath the surface layer. Mouldings, skirtings, and surface wall films are included.

The following are exempted from the requirement:

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<sup>24</sup> COMMISSION RECOMMENDATION of 18 October 2011 on the definition of nanomaterial (2011/696/EU).

- Mouldings, skirting boards and baseboards in bathrooms, professional kitchens, and stairwells.
- Floorings in professional kitchens with floor drain.
- Floorings in wet rooms with floor drain in educational buildings, homes for the elderly and homes for persons with disabilities.

*Products covered by the exemption must fulfil O25.*

- ☒ Documentation to show how the requirement is fulfilled, for example floor plans, product data sheets, construction product declarations or similar.

## Background

The requirement covers interior doors and surface layers on floors, ceilings and walls including both PVC and PVDC as a material or component. The latter may involve cork flooring coated with a thin outer layer of PVC or textile flooring with a PVC backing.

PVC (polyvinyl chloride) is one of the most widely used thermoplastic materials. Nordic Ecolabelling has traditionally been taking a restrictive position in relation to PVC due to emissions of harmful organic chemicals from manufacturing and waste management, as well as emissions of potential endocrine disruptors such as phthalates in the use stage.

It is worth noticing that PVC products today can be produced in a much more circular way as additives such as phthalates and lead/cadmium-based stabilisers can be replaced by non-hazardous alternatives. Issues associated to PVC products end-of-use are being addressed, as both techniques to safely incinerate PVC waste and handle neutralisation residues in a responsible manner exist, while take-back, collection, identification, and separation processes to increase the amount of PVC which is recycled, already exist or are being developed. It will however require a relatively extensive list of requirements to regulate the PVC used in buildings according to this. Nordic Ecolabelling will follow the development closely but do not currently see the possibility to allow PVC more generally without overcomplicating the criteria for New Buildings. Exemptions are made for areas or surfaces with specific needs for high durability or slip resistance (related to working environment legislation) and for smaller details.

When Nordic Ecolabelling's criteria for floor coverings (gen. 7) are revised and published, requirements for surface layers on floors may be adjusted according to these requirements.

### O22 Durable wood for outdoor use

The requirements for durable wood for outdoor use is described in the sections below according to the type of wood treatment.

The use of preservative-treated, chemically modified or thermally modified wood must be documented in drawings showing that the relevant use classes are fulfilled according to EN 335.

Untreated wood with natural durability is not subject to any requirements.

## Preservative-treated wood for outdoor use

The use of preservative-treated wood containing heavy metals and/or biocides is not permitted in the use classes below (use classes according to EN 335):

- Use class 1
- Use class 2
- Use class 3 (for example vertical structures in use class 3.2 such as cladding, fences, partition walls and acoustic barriers)

Exemptions:

- Windows and doors in Use class 3.1
- Horizontal structures in Use class 3.2

For preservative-treated wood in allowed applications the wood must meet the requirement on prohibited substances in in construction products, construction goods and materials in O25 and meet the requirement of durability in Table 23 below.

**Table 23 For preservative-treated wood the following documentation of durability applies.**

Wood protection method	Use class as per EN 335	Required documentation of durability
Preservative-treated Wood in accordance with NTR	UC 3.1 (only allowed for windows and doors)	NTR B
	UC 3.2	NTR AB NTR GRAN
	UC 4	NTR A
Preservative-treated wood not classified in accordance with NTR	UC 3.2	Testing by accredited laboratory: - EN 113-2 excluding testing with Coriolus versicolor after separate accelerated ageing in line with EN 73 and EN 84. - CEN/TS 12037
	UC 4	Testing by accredited laboratory: - EN 113-2 including testing with Coriolus versicolor after separate accelerated ageing in line with EN 73 and EN 84. - ENV 807 - EN 252 for at least five years in three locations, two of which are in a Nordic country.

## Chemically modified or thermally modified wood for outdoor use

The use of chemically modified or thermally modified wood must meet the requirement of durability specified in Table 24, use classes in accordance with EN 335.

**Table 24 For chemically modified or thermally modified wood, the following documentation of durability applies.**

Wood protection method	Use class as per EN 335	Required documentation of durability
Thermally and chemically modified wood classified in accordance with NTR	UC 3.1 (only allowed for windows and doors)	NTR Bmod
	UC 3.2	NTR ABmod
	UC 4	NTR Amod
Thermally and chemically modified wood not classified in accordance with NTR	UC 3.2	Testing by accredited laboratory: - EN 113-2 excluding testing with Coriolus versicolor after separate accelerated ageing in line with EN 73 and EN 84. - CEN/TS 12037
	UC 4	Testing by accredited laboratory: - EN 113-2 including testing with Coriolus versicolor after separate accelerated ageing in line with EN 73 and EN 84. - ENV 807 - EN 252 for at least five years in three locations, two of which are in a Nordic country.

- ☒ Description and drawings of the relevant constructions where preservative-treated, chemically modified or thermally modified wood is used, incl. use class according to EN 335.
- ☒ Documentation / certificate in accordance with table 23 or table 24.
- ☒ Preservative-treated wood in allowed applications must meet the requirement O25 Excluded substances in construction products, construction goods and materials..

## Background

The purpose of the requirement is to limit the use of chemical wood preservative containing heavy metals and biocides and to document the durability of treated wood. Nordic Ecolabelling recognises that it can be a challenge to use untreated wood where the exposure to weather is high. The requirement contains a list of non-permitted areas where preservative-treated, such as pressure impregnated, wood cannot be used since these areas are less exposed to weather. Also use class 5 according to EN 335, which is when wood is permanently or regular submerged in salt water, is not allowed because of the amount and types of biocides that are used.

All preservative-treated or chemically modified wood must meet the requirements for chemical substances in accordance with O32, also wood that is NTR-certified.

When preservative-treated, chemically modified or thermally modified wood is used the durability must be documented. Wood treated through impregnation with wood preservative is divided by the Nordic Wood Preservation Council (NTR) into four classes: NTR M, NTR A, NTR AB and NTR B. The classification is based on EN 351-1 and is linked to the use classes defined in EN 335. Wood protection classes NTR A, NTR B and NTR AB may be accepted, if only used for

certain parts that are judged to be particularly exposed. NTR A is allowed for wooden parts with ground contact, i.e., use class UC 4 according to EN 335. NTR B is only permitted for windows which belong to the use sub-class UC 3.1 according to EN 335. NTR AB is only permitted for specific wooden parts that belong to the use sub-class UC 3.2 according to EN 335 and as described in the requirement, i.e., parts that remain wet for long periods or where water can accumulate.

NTR's system for modified wood (thermal and chemical) is similar to its system for wood treated with chemical wood preservative. Here, the wood protection classes are NTR Mmod, NTR Amod, NTR ABmod and NTR Bmod, in line with the use classes defined in EN 335. Since 2017, it has been possible to produce thermally or chemically modified wood according to the NTR standard. However, there is still no producer who is certified (2022). Therefore, for modified wood it is also possible to test the wood in line with established EN standards for the appropriate user class as described in the requirement.

## O23 Copper

Copper is restricted in Nordic Swan Ecolabelled buildings in the following way:

- A. Tap water pipes must not contain >1% weight of copper.
- B. Roof and facade cladding materials and products for roofs and facades (roof drainage products, gutters, exhaust hoods, eaves nets, cover profiles and the like) must not contain more than 10% by weight of copper.

Exemptions:

- Visible pipelines in bathrooms.
- Water fittings connecting pipes, such as couplings or manifolds.
- Installation cabinets, such as manifold or water meter cabinets.
- Pipelines that due to national fire protection legislation must be made of copper and where alternatives are not available.
- Pipes through the wall for an outdoor tap

*Closed pipe systems such as heating or cooling circuits are not covered by the requirement.*

- Declaration from applicant, Appendix 7.
- If relevant, description of the use of copper in the project. Where relevant, supplementary documentation for roof and facade cladding, such as product data sheet, construction product declaration or information from producer.

## Background

The largest sources of copper spreading into the environment are via tap water and road traffic. Sheet metal on the outside of buildings (roofs and facades) and contact cables for the railway are also relatively large sources. The primary recipients of the copper differ. For water mains, it is the sewage treatment plant,



while the distribution of copper in road traffic primarily ends up in stormwater and soil. A predominant percentage (60–80%) of the copper entering the treatment plants originates from tap water pipes in properties.

A large part of the copper that reaches the treatment plants via wastewater ends up in the sludge. Unfortunately, the general positive trend for reduced levels of metals in the sludge does not apply to copper and zinc. One reason is that copper is largely built into the infrastructure and it is therefore not as easy to reduce the supply of copper as it is for other metals that should be reduced in the cycle. The Swedish Environmental Protection Agency states that the copper levels found in arable land do not show negative microbiological effects, but that the margin is small. Both the background content of copper and local factors varies across the country. To provide general protection against the effects of copper, it is therefore justified to have stricter requirements regarding copper for the return of sludge. The Swedish Environmental Protection Agency further states that the supply of copper must specifically be reduced for sludge to be recycled in a manner that is sustainable in the long term. This is important as increased recycling of phosphorus from sludge is desirable from a resource efficiency and recycling point of view. This is the primary reason why Nordic Ecolabelling wants to limit copper as a material in tap water pipes and as a roof and facade material.

A study carried out by SYKES<sup>25</sup> on behalf of the Finnish Ministry of Employment and Economic Affairs concludes that the negative effects of the supply of copper to the environment through sludge returned to agricultural land are not a general Nordic problem. This is correct. However, the problem is not limited to the Stockholm area, which is incorrectly pointed out in the investigation. On the contrary, copper is a limiting factor for returning sludge to arable land in large parts of Sweden. Nordic Ecolabelling has concluded that it is not relevant to write geographically adapted requirements. Therefore, a general Nordic restriction requirement remains in the criteria.

#### O24 Plastic and rubber surfaces on playgrounds and outdoor areas

The use of impact attenuating ground cover materials with synthetic components is restricted on outdoor areas in connection with the Nordic Swan Ecolabelled building by the two means below.

Examples of these materials are artificial turf, mats, tiles or in situ cast surfaces made from plastic or rubber. Fibres, chips, or granules of renewable materials with a synthetic binding agent or cover are also subject to the requirement.

Materials in artificial turf, mats, tiles and granulate must be declared according to O25 and Appendix 8. Binding agents and glue used outdoors for installation are exempt from the chemical requirements.

- a) Synthetic ground cover materials must not contain material from recycled tyres (SBR).

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<sup>25</sup> Jyrki Laitinen and Riikka Malila, Finish Environment Institute, Sustainable Water Management, Assessment of pipe material used in buildings, Carbon footprint and health and toxicity effects, November 2020.

- b) Surfaces must not consist of material with loose infill of plastic or rubber granules.

Exemption: Ground cover materials with synthetic/plastic components may be installed on areas subject to accessibility requirements\*. In addition it can only be installed in the fall zone according to EN 1176 and EN 1177 and in small enclosed\*\* multisport pitches that are part of a school yard. Granule catchers or other systems for microplastic retention must be installed in drains adjacent to the materials.

\*Due to legislation, municipal requirements, or requirements from the procurer.

\*\*The enclosure must have openings accessible for persons with disabilities.

- Situation plan showing the use of impact attenuating and accessible surfaces on playgrounds and outdoor areas.
- Drawings where the fall zone is defined according to EN 1176 and EN 1177.
- For football/multisport pitch in a school yard: Reference to accessibility requirements: legislation, requirements from municipality or procurer. Product sheet for the small enclosed/multisport pitch.
- Product sheets for microplastic retention systems installed.
- Product sheets or other documentation showing compliance with parts a) and b).

## Background

Nordic Ecolabelling wishes to minimise the use of plastic and rubber ground cover materials but recognises the need for impact attenuating surfaces accessible to people with disabilities and therefore work with restrictions rather than prohibitions.

Artificial turfs with loose infill of granules and mulches have been identified as major sources of microplastic pollution.<sup>26, 27</sup> Granules and mulches are often made from recycled tyres (SBR) and can contain several potentially hazardous substances, including polycyclic aromatic hydrocarbons (PAHs), metals and phthalates.<sup>28</sup> REACH sets limit values for eight PAHs which cannot be exceeded by granules and mulches put on the market<sup>29</sup>. These eight are however only a small part of the over 300 identified substances found in SBR rubber granules. ECHA recommends further investigation into the effects on health and environment for some of these substances<sup>27</sup>. Nordic Ecolabelling has prohibited the use of rubber from recycled tyres (SBR) to reduce undesired substances.

Plastic- and rubber-based ground cover also comes in the form of granules held together by polymer-based binders. These materials are cast on the site using isocyanate binding agents or delivered as prefabricated mats or tiles that are screwed or glued to the underlay and sometimes covered by a layer of artificial

<sup>26</sup> <https://www.ivl.se/download/18.34244ba71728fcb3f3f9f0/1591705616592/C183.pdf>

<sup>27</sup> <https://www.miljodirektoratet.no/globalassets/publikasjoner/m954/m954.pdf>

<sup>28</sup> [Granules and mulches on sports pitches and playgrounds – ECHA \(europa.eu\)](#)

<sup>29</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1199&from=EN>

turf glued on top. Although the granules are bound together, there will be spread of microplastics due to wear on the surfaces<sup>30</sup>. Alternative products containing cork or other natural materials instead of synthetic rubber granules are potentially less severe sources of microplastic, since only the binding agent is plastic. The materials also reduce the spread of undesired substances that can still be present in plastic and rubber materials even if they are free from recycled SBR. Wood chips or bark covered with rubber or plastic materials may not be used since they contain synthetic components but are not suitable for accessibility reasons.

Nordic Ecolabelling wishes to minimise the use of isocyanates on the construction site. The isocyanate binding agents and glues used for installation of the impact attenuating surfaces typically do not comply with the chemical requirements O22 and O23 and they are only accepted in this application, with restrictions, since there is a lack of alternatives for accessible surfaces. The commission regulation EU 2020/1149 will be implemented during the summer 2023 according to our information. For the PU products exempted this means that no additional working environment requirements will be implemented. This should be handled satisfactory according to this new legislation.

## 9.4 Construction products – ingoing substances and emissions

### O25 Excluded substances in construction products, construction goods and materials

The requirement applies to the following product categories:

1. Sealing products, including membranes, tape and sealing collars on walls, foundation, and roofing, which are not classified as chemical products.
2. Thermal, acoustic and technical insulation.
3. Interior and exterior building panels. Does not include panels of solid wood, laminated timber, veneer, OSB, plywood, MDF/HDF, chipboard, HPL, CPL and compact laminates, which are regulated in requirement O27.
4. Heavy current cables and electrical conduits\*
5. Wood that is preservative-treated or chemically modified as protection from rot, blue stain, and mould (see O22 for restrictions on use)
6. Wood plastic composite (WPC)
7. Plastic coverings for floors, ceilings, and walls for interior use.
8. Textile coverings for floors, ceilings, and walls.
9. Artificial turf, mats, tiles and granulate used in impact attenuating outdoor surfaces as defined in O24.

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<sup>30</sup> <https://www.ivl.se/download/18.57581b9b167ee95ab9919a1/1552466299144/C359.pdf>

In the construction products and materials mentioned above, the following substances must not be an ingoing substance in the product. Ingoing substance means all substances in the construction product that are present in concentrations higher than 100 ppm (0.010 w%, 100 mg/kg).

- Substances categorised as Substances of Very High Concern (SVHC) and included on the EU Candidate List.
- Substances evaluated by the EU to be persistent, bioaccumulative, and toxic (PBT) or very persistent and very bioaccumulative (vPvB), in accordance with the criteria in Annex XIII of REACH.
- Substances classified as carcinogenic, mutagenic, or toxic for reproduction (CMR) Category 1A or 1B.
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, II and III, see the following links.
  - <https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu>
  - <https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption>
  - <https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities>

*A substance that is transferred to one of the corresponding sublists called "Substances no longer on list" and no longer appears on any of Lists I–III, is no longer excluded. The exception is those substances on sublist II that were evaluated under a regulation or directive that does not have provisions for identifying EDs (e.g., the Cosmetics Regulation, etc.). For those substances, ED properties may still have been confirmed or suspected. Nordic Ecolabelling will evaluate the circumstances case-by-case, based on the background information indicated in sublist III. In addition, the following individual substances and substance groups are prohibited or restricted. There may be an overlap between the substances listed below and substances categorised above.*

- Short-chain chlorinated paraffins (C10-C13) and medium-chain chlorinated paraffins (C14-C17).
- Perfluoroalkyl and polyfluoroalkyl substances (PFASs)
- Alkylphenols, alkylphenol ethoxylates (APEO) and other alkylphenol derivatives (APD).
- Brominated flame retardants.
- Phthalates (Esters of phthalic acid (orthophthalic acid / phthalic acid / 1,2- benzene dicarboxylic acid).

- The heavy metals lead, cadmium, arsenic, chromium (VI), mercury and their compounds.
- Bisphenol A (CAS no. 80-05-7), bisphenol S (CAS no. 80-09-1) and bisphenol F (CAS no. 620-92-8).
- Boric acid, sodium perborate, perboric acid, sodium borate (borax) and any other boron compounds classed as carcinogenic, mutagenic or reprotoxic in category 1A/1B/2/Lact.
- Organotin compounds.

Exemption:

The material in (electrical) conduits may contain brominated flame retardants provided that the following limits are fulfilled:

- Bromine content (Br)  $\leq 0.15\%$
- Chlorine content (Cl)  $\leq 0.15\%$
- Total content: bromine content (Br) + chlorine content (Cl)  $\leq 0.2\%$

The content must be verified using ion chromatography (IC) according to the methods in EN 14582 or modified IC methods according to EN50642

- Declaration from the manufacturer of the construction product, construction goods or construction material in accordance with Appendix 8.
- Construction product declaration or corresponding if available for the product.

## Background

The requirement comprises two parts. First comes a description of which construction products are included, i.e., those for which the chemical content must be verified. The purpose is to focus on the most important construction supplies and thereby the material within the vapour barrier (moisture barrier), supplemented with known problematic material outside the vapour barrier. The second part of the requirement concerns a list of the substances/groups of substances that may not be contained in these construction supplies in quantities of 100 ppm or more.

The list is based on the general principles from Nordic Swan Ecolabelling regarding undesirable compounds in combination with corresponding requirements for other Nordic Swan Ecolabelled construction products. A few exemptions are made when deemed necessary for the quality and technical performance of the product.

Textile coverings for floors, ceilings and walls are added as a new product type, since they are highly relevant in offices. Textile flooring may contain chemical substances from production that can affect the indoor environment – this is especially relevant due to the large surface areas of textile flooring and because

the products are not washed before usage. Textile flooring is often produced outside the EU and there is no regulation specifically for these products, meaning that the general rules in REACH apply. Relevant substances are phthalates, PFAS, aldehydes and a range of other VOC<sup>31</sup>. Nordic Ecolabelling focuses on setting strict chemical requirements for the known problematic substances in the textile flooring, thereby limiting exposure to these substances for the end-user. Emission testing is not a requirement as the main environmental and health effects in relation to the relevant chemicals are considered to be handled in the general chemical requirements. All products used on floors, ceilings or walls are covered by the requirement.

Drainage pipes are no longer covered by the requirement as the materials used (PP, PE and (hard) PVC) are found to have little relevance with regard to the chemical substances regulated in the requirement. Plastic pipes for drinking water are not regulated by Nordic Ecolabelling, as national legislation and certification systems already set requirements for these products (e.g., GDV in DK and Rise/Kiwa in SE).

## O26 Antimicrobial surface treatments

Nanoparticles (see definitions) and biocide treatments must not be used with the purpose to create an antibacterial or antiviral surface or effect.

The requirement applies to the following construction products, construction goods or materials:

- Flooring and floor coverings.
- Wall coverings in ceramic material or stone.
- Kitchen and bathroom fittings such as worktops, splashbacks, cabinet fronts, kitchen sinks, mirrors, shower walls, sanitary appliances (WC, urinal, bath, shower, washbasin, sink, bidet etc.)
- White goods (air filters and door gaskets are exempted).
- Ventilation filters and textile ducts/diffusers.
- Waste disposal units.

☒ Declaration from the applicant confirming compliance with the requirement concerning antibacterial/antiviral surfaces. Appendix 9 must be used. Verification of this requirement is not done in the Supply Chain Declaration Portal (SCDP).

## Background

Antimicrobial (e.g., antibacterial or antiviral) treated products are often marketed as preventing bacteria or viral formation, growth and odours. Yet antimicrobial treatment is often not needed, and many of its methods must be used with caution, since they can be hazardous to human health and the environment. Antimicrobial substances are biocides. Increased use of biocides can

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<sup>31</sup> Kortlægning og risikovurdering af kemiske stoffer i gulvtæpper til børn, Kortlægning af kemiske stoffer i forbrugerprodukter nr. 147, 2016.

lead to bacteria becoming resistant to agents that are necessary for hygiene and health in other contexts.

The general requirement in generation three of the criteria regulating nanotreatment of construction products has been removed. By assessing the licensing data and the general state of the market, it has been concluded that the primary effect of the nano requirement was to regulate antimicrobial treatments. This is handled in this new requirement. Furthermore, the work from the Swedish National Platform for Nanosafety concludes in their report “Nanomaterial i byggbranschen” that nanomaterials have a limited use within the building sector today. Nordic Ecolabelling will consider regulating this area again if the situation changes over time.

## O27 Formaldehyde emissions

The requirement covers all wood-based or laminate panels and boards for indoor use, containing formaldehyde-based additives, such as building panels (raw or surface treated), panels in floors, panels in doors\* or other fitments as well as mouldings, baseboards and frames. Permanently installed fittings, furniture and trimmings as well as loose fittings and furniture (e.g., wardrobes and lockers) that are included in the construction project are subject to this requirement.

The requirement does not apply to panels solely marketed as facade panels, solid wooden worktops or fixture details present in a very limited extent such as an individual hat or shoe shelf.

The average emission of formaldehyde must not exceed the limit values for the relevant test method according to Table 25.

*\* For Finland, apartment doors that are fire-protected according to EN16034 instead of the emission limit value in the table above must comply with M1.*

**Table 25 Threshold limits for formaldehyde emissions.**

Test method	EN 717-1	EN 16516
<b>MDF</b>	0.09 mg/m <sup>3</sup>	-
<b>Other panels/mouldings/beams/columns</b> (including glulam, CLT etc.)	0.07 mg/m <sup>3</sup>	-
<b>Other panels/mouldings/fitments than wood</b> Including high pressure laminates (HPL), continuous pressure laminates (CPL) and compact laminates	NA	0.03 mg/m <sup>3</sup>

*If the panel is covered by e.g., melamine or laminate, it is the complete product with covering that should be tested. If a fitment consists of more than one panel, the complete product can be tested or the panels can be tested separately.*

*Analysis methods other than those stated in the above table can be used, provided that the correlation between the testing methods can be verified by an independent third party.*

*If legislation is introduced or tightened and becomes tighter than Nordic Ecolabelling's requirement levels for formaldehyde during the term of validity of these criteria, this requirement will be adjusted.*

- ☒ Analysis report including measurement methods, measurement results and measurement frequency. It must be clearly stated which method has been used, who carried out the analyses and that the testing institution is an independent third party. Test methods other than those specified may be used if there is correlation between test methods and this can be confirmed by a competent third party.

## Background

The requirement is harmonised with Nordic Swan Ecolabelled building panels where reference is made to EN 717-1 and EN 16516. Threshold limits are at the same level in this criterion. Other test methods may be approved if an independent third party (e.g., a test institute) has made a correlation to these methods.

Adhesive systems containing formaldehyde are often used in the manufacture of wood-based panels. The development shows reduced emissions of formaldehyde from the finished panel. Formaldehyde is a toxic, sensitising, and carcinogenic substance that Nordic Ecolabelling wants to limit as far as possible from a work environment point of view in manufacturing, but also to reduce emissions in the use phase.

Formaldehyde emissions from wood-based panels are communicated in the EU with a classification system, defined in the harmonised standard EN 13986. The current lowest emission class is E1, where the limit values are a maximum of 0.124 mg/m<sup>3</sup> according to test method EN 717-1. Work is underway on a new common statutory lower limit value in the EU. Nordic Ecolabelling is monitoring this work and will review all criteria with requirements for formaldehyde emissions when the limit value has been decided.

## 9.5 Ecolabelled products

### O28 Ecolabelled products

A minimum point score for ecolabelled products must be achieved in P19 according to Table 26.

**Table 26** Minimum point score for each country.

Country	Minimum points
DK/SE/NO	8
FI	6
IS	5

- ☒ Confirmation that minimum point score is achieved in P19.

### P19 Ecolabelled products

Using Nordic Swan Ecolabelled or EU Ecolabelled products qualify for points. Using ecolabelled products for more than 10% of the need of products in each product category will grant points according to Table 27. The sum is rounded off to the nearest whole number.

A maximum of 14 points can be achieved. A minimum point score must be achieved according O28.



**Table 27 Product categories available for points.**

Product category	Points granted according to share of ecolabelled products in each product category				
	>10%	>30%	>50%	>70%	>90%
Construction and facade panels for outdoor use	0.2	0.6	1	1.4	2
Construction panels, wall covers, mouldings and panels for indoor use.	0.2	0.6	1	1.4	2
Flooring (visible layer, excluding tiles)	0.3	0.9	1.5	2.1	3
Tiles (floors and walls)	0.1	0.3	0.5	0.7	1
Bathroom fittings (front, frames and countertops)	0.1	0.3	0.5	0.7	1
Wardrobes (including coat racks/hat shelves and similar)	0.2	0.6	1	1.4	2
Kitchens (front, frames and countertops)	0.3	0.9	1.5	2.1	3
Windows	0.3	0.9	1.5	2.1	3
Exterior doors	0.1	0.3	0.5	0.7	1
Indoor doors	0.2	0.6	1	1.4	2
Outdoor furniture	0.2	0.6	1	1.4	2
Playground and park equipment	0.2	0.6	1	1.4	2
Stove/fireplace	0.1	0.3	0.5	0.7	1
Durable wood	0.2	0.6	1	1.4	2
Indoor paint	0.3	0.9	1.5	2.1	3
Indoor fillers	0.2	0.6	1	1.4	2
Outdoor paint	0.2	0.6	1	1.4	2
Sealants	0.2	0.6	1	1.4	2
Adhesives for glass felt and microdispenser	0.2	0.6	1	1.4	2
Other chemical building products	0.1	0.3	0.5	0.7	1
Other products					Defined when relevant
<b>Maximum points total</b>					14

*The most suitable unit can be used, as long as the unit is consistent within each product group. Units used can be for example m<sup>2</sup>, litres, m<sup>3</sup> or kg.*

- Completed calculation with relevant product information.
- Documentation for amounts and products in calculation such as invoices or estimates of relevant amounts.

## Background

In their life cycles, construction materials have been shown to contribute to environmental impacts such as energy and resource consumption, undesirable chemical risks, and negative effects on biodiversity. The criteria for ecolabelled construction materials set requirements for environmental parameters throughout the product's life cycle, having a relevant environmental impact that can be reduced and documented in relation to ecolabelling.

To be able to make a difference, it is important that a Nordic Swan Ecolabelled building uses a certain amount of the building products with a reduced

environmental impact that are available in the market. Construction materials, in a variety of product categories with the Nordic Swan Ecolabel and the EU Ecolabel are available in all Nordic markets, which makes it easier to promote their use in Nordic Swan Ecolabelled buildings.

The building materials represent an increasingly larger share of the environmental burden, and the product decisions in a project give a significant environmental effect. This is the main reason for our decision to change the requirement (from version 3 to 4 of the criteria document), to an obligatory one, thereby encouraging projects to buy more ecolabelled products in Nordic Swan Ecolabelled building projects.

## 10 Biodiversity and wood raw materials

### O29 Tree species with restricted use

This requirement applies to all wood-based products used in the construction of the Nordic Swan Ecolabelled building, supplementary buildings and outdoor areas. The requirement also applies to wood-based products used in construction but not incorporated in the building, such as wood in casting moulds.

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

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

The use of tree species listed on a) CITES (Appendices I, II and III) **is not permitted.**

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

- the tree species does not originate from an area/region where it is IUCN red listed, categorised as CR, EN or VU.
- the tree species does not originate from an Intact Forest Landscape (IFL), defined in the World's IFL 2000 map in Google Earth <http://www.intactforests.org/world.map.html>.
- the tree species shall originate from an FSC or PEFC certified forest/plantation and shall be covered by a valid FSC/PEFC Chain of Custody certificate documented/controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.
- Tree species grown in plantations shall, in addition, originate from a FSC or PEFC certified forest/plantation established before 1994.

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

The declaration is made by the applicant for the whole project.

The declaration is made by the supplier if the wood-based products are subject to declaration in the supply chain declaration portal.

- Declaration that tree species listed in a–d are not used in the Nordic Swan Ecolabelled building. Appendix 10 must be used.

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

- If a tree species is listed in either b, c or d, the supplier is required to present a valid FSC/PEFC Chain of Custody certificate that covers the specific tree species and demonstrates that the tree is controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.
- If a tree species is listed in either b, c or d, the supplier is required to document full traceability back to the forest/certified forest unit, thereby demonstrating that:
- the tree species does not originate from an area/region where it is IUCN red listed, categorised as CR, EN or VU.
  - the tree species does not originate from Intact Forest Landscape (IFL), defined in the World's IFL 2000 map in Google Earth <http://www.intactforests.org/world.webmap.html>.
  - for plantations, the applicant/manufacturer/supplier is required to document that the tree species does not originate from FSC or PEFC certified plantations established after 1994.

## Background

A number of tree species are restricted or not permitted for use in Nordic Swan Ecolabelled buildings. The requirement applies only to virgin forest tree species and not tree species defined as recycled material according to ISO 14021. The list of restricted tree species is based on the wood species that are relevant to Nordic Ecolabelling's criteria, i.e., tree species that have the potential to be included in Nordic Swan Ecolabelled products. Listed tree species are indicated by the scientific name and the most common trade names.

The criteria for tree species found in the list relate to wood originating from:

- Tree species listed on CITES<sup>32</sup> Appendices I, II and III.
- IUCN red list<sup>33</sup>, categorised as critically endangered (CR), endangered (EN) and vulnerable (VU).

<sup>32</sup> <https://www.cites.org/> (visited January 2020)

<sup>33</sup> <http://www.iucnredlist.org/> (visited January 2020)

- Regnskogsfondet<sup>34</sup> (Rainforest Foundation Norway) tree list
- Siberian larch (originating in forests outside the EU)

Many of the tree species on the list are grown in countries which still have large areas of Intact Forest Landscapes (IFLs). Protecting these is important for biodiversity and climate. Many of these countries also have a high risk of corruption and the national legislation related to the environment, human rights and land ownership are weak and/or not controlled by the authorities. There are different views on whether certification is good enough to meet the challenges of forest management in countries with a high risk of corruption and illegal logging. Due to the uncertainty about whether FSC and PEFC certification systems are good enough in protecting important areas of biodiversity and ethical aspects such as human rights and land ownership in areas with a high risk of corruption, Nordic Ecolabelling takes a precautionary approach and wants further documentation about the tree species and its origin.

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

### O30 Wood and bamboo, traceability and certification

This requirement applies to the following construction elements of solid wood, glulam, LVL, bamboo, plywood, veneer or particle/fibre board used in the construction of the Nordic Swan Ecolabelled building and supplementary buildings:

- Frames, trusses, studs and joists used in the wooden structure of the building (roof, walls and floors)
- Underlay on roofs, walls and floors such as plywood, particle boards, tongue-and-groove and rafters
- Interior panels
- Exterior cladding and facade panels
- Timber for balcony, terrace, decking, veranda and fences
- Wooden floors

*If the applicant wants to include other building parts than the above listed in the calculation of certified wood raw materials, e.g., windows, this includes the total volume of wood used in that building part throughout the building. Nordic Swan Ecolabelled construction and façade panels comply with the certified wood raw material requirement.*

#### **Name of tree species**

The applicant/supplier must state the name (species name) of the wood raw material or bamboo used in Nordic Swan Ecolabelled buildings.

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<sup>34</sup> <https://www.regnskog.no/no/hva-du-kan-gjore/unnga-tropisk-tommer/tropiske-treslag> (visited January 2020)

### **Chain of Custody certification**

All the above mentioned construction elements of wood raw materials and bamboo used in the Nordic Swan Ecolabel building must be covered by chain of custody certificates issued by FSC or PEFC.

The supplier of wood raw materials/bamboo materials must have valid Chain of Custody (CoC) certification under the FSC/PEFC schemes.

Suppliers who only deliver non-certified recycled material in the Nordic Swan Ecolabelled buildings are exempted from the requirement for Chain of Custody certification. For a definition of recycled material, see below\*.

As an exemption to the above, a supplier (e.g., a joinery workshop) of the applicant that does not have FSC/PEFC CoC certification may also be approved. This is subject to a guarantee from the supplier that the wood raw materials are purchased from a CoC certified supplier of wood that can prove that the wood raw materials comply with the requirements stated here. The supplier must guarantee that the certified wood is sold to the applicant of the Nordic Swan Ecolabelled building. The applicant must have an agreement with the supplier which describes how the supplier guarantees that the certified timber will be delivered to the applicant. The agreement shall state that the supplier is obliged to report to the applicant when changing wood supplier.

### **Certified wood raw materials and bamboo**

A minimum of 70% by weight of all wood raw materials and bamboo used in the Nordic Swan Ecolabelled building must originate from forests managed according to sustainable forest management principles issued by FSC or PEFC and meet the requirements set out by the FSC or PEFC Chain of Custody schemes or be recycled material\*.

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

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

*\* Recycled material is defined according to ISO 14021 in the categories of pre-consumer and post-consumer.*

- The names (species names) of the wood raw materials and bamboo that are used.
- Valid FSC/PEFC Chain of Custody certificate from all suppliers of wood-based products, covering all wood materials and bamboo used in the Nordic Swan Ecolabelled building. Alternatively, a link to the certificate holder's valid certificate information in the FSC/PEFC certificate database.

- ☒ Documentation alternative 1: A summary showing i) the total quantity of wood raw materials and ii) the total percentage of certified wood raw material or recycled material used in the project. Copy of invoice(s) which confirms the FSC/PEFC status of the products and the FSC/PEFC certificate number of the immediate supplier to confirm the proportion of certified wood raw materials or recycled materials purchased for the project.
- ☒ Documentation alternative 2: An aggregated signed list from suppliers (compilation of all wood raw material deliveries to the project containing information on: CoC code, name of tree species, type of product items, FSC/PEFC claims for each product item, quantities of wood raw materials and percentage of certified/recycled wood and the invoice number (reference)) can be used as a basis for the summary. Nordic Ecolabelling may ask for copies of invoices to confirm the proportion of certified timber purchased for the Nordic Swan Ecolabelled building.
- ☒ If the applicant does not use a CoC certified supplier, the supplier shall present i) invoices for the wood raw materials in question from the CoC certified supplier and ii) a valid certificate which must be in accordance with the invoice(s). The invoice must state the volume of certified wood raw material and certification number. The applicant must have a documented agreement with the supplier which describes how the supplier guarantees that the specified, certified wood raw material on the invoice is delivered to the project. The agreement shall also state that the supplier is obliged to report any change in the source of the wood raw material. Nordic Ecolabelling may ask for further information.

## Background

The intention is to include wood products used in the largest volumes in the construction of the building. Nordic Ecolabelling requires that wooden construction elements must come from sustainable forestry through requirements to traceability and certification. The requirement for Chain of Custody certification contributes to traceability in the supply chain within FSC and PEFC's control systems for traceability. Both the FSC and PEFC schemes allow several methods to verify the traceability: physical separation method, percentage-based method, and volume credit method. Nordic Ecolabelling accepts all FSC and PEFC's methods to verify traceability and the share of certified and controlled wood/sources. Suppliers of recycled material are exempted from the requirement regarding Chain of Custody certification.

It is possible to use a supplier that is not CoC-certified as not all small/local suppliers are certified. In such cases, it should be documented that wood raw materials are purchased from certified areas.

Applicants must document that at least 70% by weight or volume of all wood raw materials and bamboo used in the Nordic Swan Ecolabelled building comes from forestry certified under the FSC or PEFC schemes or is recycled material. The remaining proportion of wood must meet the requirements of FSC controlled wood or PEFC controlled sources or be recycled. The requirement limit, a minimum of 70% of all wood raw material (virgin or recycled), correspond to the

FSC and PEFC's requirement limits for use of the respective labels on products, such as "FSC Mix" and "PEFC certified".

The applicant must demonstrate that the quantity of certified wood raw material or recycled material is met. The certification shall be documented through invoices/delivery notes from suppliers or an aggregated signed list from suppliers. The invoices/aggregated signed list must contain information on: CoC codes, name of tree species, type of product items, FSC/PEFC claims such as FSC MIX 70% or FSC 100% for each product item and quantities of wood raw materials. In the case of an aggregated signed list, Nordic Ecolabelling may ask for copies of invoices to confirm the proportion of certified timber purchased.

### O31 Assessment of the biodiversity on the project area

The biodiversity at the building plot/project area must be assessed and documented in an ecology report. The overall ecological quality of the building plot/project area must be assessed. All individual sub-areas of the project area must be accounted for.

The ecology report must be done by a biologist/ecologist/landscape architect or person with equivalent competence with experience within mapping biodiversity on building plots/sites. Whenever possible, the report must be completed before the preparation of the building site and the construction process begins.

The ecology report must include a description of the existing biodiversity (before tillage/construction has started) at the building plot/project area. See appendix 11 for more guidance. The ecology report must include the following:

- Existing plant cover (trees, bushes, hedges, etc.), fauna and habitats on the building plot
- General terrain description, including neighbouring land/habitat
- Any types of nature or animal/plant species on the building plot or adjacent to the building plot (neighbouring land) that are of national management interest, for example protected, threatened or prioritised species
- Any invasive species

In addition, recommendations for measures to preserve and/or improve the biodiversity on the site (reference can be made to O32) must be given.

*Assessment/mapping that have already been made in connection with preparation/planning of the project e.g., the municipality in connection with the approval of local plans/project plans or as part of the building permit, can be included in the documentation.*

- Description of qualifications and experience of the expert who has carried out the analysis.
- Ecology report according to the requirement.

## Background

The ecology report is intended to give advice on measures that preserve and improve the biodiversity on the site. To succeed, it is important to have advice based on professional knowledge. Mapping of habitat types and species over larger areas is usually done by public authorities according to specific methods, and the results are available to the public. The intention here is to map biodiversity on the plot before construction works start. The methods and scope of the mapping should be adapted according to the kind of biodiversity that is often found on plots for housing, and according to the size and condition of the plot. The surveyor can use data from public databases and should also collect data from inspections on site. In the report, the surveyor should describe the natural diversity that already exists in the area, such as red-listed and alien species and elements of great ecological value such as old trees. In addition, there must be recommendations for measures to preserve and/or improve the biodiversity on the site.

### O32 Measures to preserve and improve the biodiversity

Based on the output of the ecology report in O31 a description must be made of planned measures to preserve the existing biodiversity (such as old trees, natural ponds, and streams) and planned measures to improve the biodiversity at the building plot during and after the building/project is completed.

The following measures must as a minimum be included in the description and implemented on the building plot\*:

- Elements with natural value that already exist on the building plot must, as far as possible, be protected in accordance with the recommendations in the ecology report.
- Invasive plant species found on the building plot/project area must be removed or controlled\*\*. Such species must also not be planted. This also applies to green roofs.
- National plant/tree\*\*\* species must be preferred planted on the building plot/project area.

*\*If the applicant does not own the building plot/project area, the applicant must have an active dialogue with the owner of the building site to implement the measures listed in this requirement.*

*\*\* This mainly applies to species that are prohibited from being imported and sold. They are found in the following documents: Denmark: The Danish Environmental Protection Agency's list of invasive species. Finland: National list of invasive species. Norway: Regulation on invasive organisms Appendix 1. Sweden: Currently, the requirement applies to species on the EU list and the list of most problematic species that have not yet been regulated by law. This may be changed when the authorities prepare new lists. Iceland: Act 583/2000. All countries: Regulation (EU) 2016/1141.*

*\*\*\*These are species that originated and developed in its surrounding habitat and has adapted to living in that particular environment. They are well adapted to the climate, light, and soil conditions that characterize their ecosystem.*



- ☒ Description of planned measures to preserve the existing biodiversity and planned measures to improve the biodiversity at the building plot/project area during and after the building/project is completed.
- ☒ If the applicant does not own the building site: Documentation of dialogue with the owner of the site regarding possible implementation of the measures listed in the requirement.

## Background

The required measures are meant to preserve valuable elements already present at the building plot, remove invasive species and plant plants adapted to the native environment.

Elements of high importance for biodiversity on the plot should be preserved. This applies for example to old oaks and other large trees, or naturally occurring streams or ponds.

Invasive alien species are one of the five greatest causes of loss of biodiversity. Invasive species should be removed or controlled to make room for native species.

Loss or deterioration of contiguous habitats is one of the greatest threats to biodiversity. Shrubs and trees that originally belong to the local area create better living conditions for local species of insects, birds and animals. Local species can also help to create cohesive habitats where insects, animals and birds can move around.

### O33 Management plan for the biodiversity

The applicant must deliver a management plan for the biodiversity on the property, and it must be handed over to the future residents and/or caretakers. The following must, as a minimum, be included in the plan if it is considered relevant in the ecology report (requirement O31):

- Ecology report or summary of the report
  - Instructions and recommendations to maintain the outdoor green areas and measures to preserve and increase biodiversity on the site
  - Recommendation to plant native plant species with suggestions on which native species to plant
  - Reference to overview/list of invasive plant species that should not be planted.
  - Description of good gardening practice and a recommended ban on the use of pesticides on green areas and guidance on which alternative methods of pest and weed control are recommended
- ☒ Management plan for the biodiversity on the site and information about how it will be handed over to future residents and caretakers.

## Background

To succeed in the long term, it is important to have a management plan with clear instructions for how biodiversity is to be preserved. A management plan supports future residents and caretakers in managing the outdoor areas. It also increases awareness of good gardening practices related to preserving and improving biodiversity. In addition it aims at phasing out the use of pesticides.

### P20 Biodiversity measures and ecosystem services

Points are awarded for measures that preserve and promote biodiversity on the property.

A maximum of 6 points can be obtained from the measures in Table 28.

**Table 28 Biodiversity measures**

Measures	Points
<b>Green roofs:</b> The total green surface must be at least 50% of the possible available roof area (area underneath solar panels is exempted). If a green roof is combined with cultivation boxes, the cultivation boxes must be in addition to the 50%, alternatively the total green surface (green roof + cultivation boxes) must be at least 75% of the total area. 1 point for extensive roofs and 2 points for intensive roofs. *	1-2
<b>Management of surface water:</b> Local management of surface water (rain or melt water that flows over various surfaces such as grass, gravel, asphalt and roofs, or drainage water) that promotes biodiversity, i.e., the establishment of open waterways and ponds with natural banks, moisture habitats and rain beds.	2
<b>System for collection of rainwater for irrigation</b>	1
<b>Permeable surfaces:</b> At least 75% of the area of all paths, common areas/squares, and/or play grounds/-scapes on the site are permeable. Parking spaces are not included. Asphalt, tiles, concrete pavements and rubber mulch/turf are not considered permeable. Permeable grass reinforcement is accepted.	2
<b>Urban gardening:</b> Create opportunities for urban gardening, e.g. in cultivation boxes. Water outlets should be located nearby. There is no requirement for how large the area should be, but an overall assessment must be made by the biologist/ecologist/landscape architect or person with equivalent competence (requirement O36).	1
<b>Gardens with rich biological diversity:</b> Emphasis will be placed on increasing the proportion that is not monoculture, increasing the proportion of perennial beds, flower meadows, multi-layered vegetation and new habitats. The gardens should have edible plants, fruit trees and plants that benefit pollinators (bumblebees, butterflies, etc.). Trees, plantings and any green roofs must be planned so that it is easier for the insects to move around. There is no requirement for how large the area should be, but an overall assessment must be made by the biologist/ecologist/landscape architect or person with equivalent competence (requirement O36).	2
<b>Habitats for insects, birds, mammals:</b> Create habitats for local species of insects, birds, mammals or ponds for amphibians according to the biologist/ecologist/landscape architect or person with equivalent competence (requirement O36) recommendations.	1
<b>Habitats/ecological corridors:</b> Restore and link together existing surrounding habitats/ ecological corridors and land features to support wildlife according to the biologist/ecologist/landscape architect or person with equivalent competence (requirement O36) recommendations.	1
<b>Natural playscapes or nature-based playgrounds:</b> Create natural playscapes or nature-based playgrounds according to the biologist/ecologist/landscape architect or person with equivalent competence (requirement O36) recommendations.	1

<p><b>EU taxonomy DNSH 6.2: Evaluation report that concludes that the construction of the new building is not built on one of the following:</b></p> <p>1) Arable land and crop land with a moderate to high level of soil fertility and below-ground biodiversity as referred to in the EU LUCAS survey.</p> <p>2) Greenfield land of recognised high biodiversity value and land that serves as habitat of endangered species (flora and fauna) listed on the European Red List or the IUCN Red List.</p> <p>3) Land matching the definition of forest as set out in national law used in the national greenhouse gas inventory, or where not available, in accordance with the FAO definition of forest.</p> <p>The evaluation report must be done by a biologist/ecologist/landscape architect or person with equivalent competence with experience within mapping biodiversity on building plots/sites.</p>	1
<p><b>Bird friendly glass facades:</b></p> <p>All glass railing used on terraces and balconies in the building/project is endowed with inherent properties that reduce bird collisions i.e., UV-patterned glass, window films, frit or acid-etched patterns on glass, opaque and translucent glass that is etched, stained, or frosted.</p>	1
<p><b>Light pollution:</b></p> <p>In addition to requirements for outdoor lighting in O4 Light management, a comprehensive plan for outdoor lighting is made by a lighting consultant. The plan should include measures to counteract light pollution and illuminate only the areas that are necessary for safety and security reasons on the plot.</p>	1
<b>Maximum points</b>	<b>6</b>

\* *Extensive roofs have a thin layer of soil or mats of growth medium (often sedum roofs). Intensive roofs have a thicker soil mass that can support shrubs and small trees and thereby contributes to greater biological diversity.*

- Description of the measures that are implemented. Reference must be made to the recommendations in the ecology report when relevant
- Documentation for the establishment of measures.
- A comprehensive plan for outdoor lighting and CV for the lighting consultant.

## Background

### *Green roofs*

Green roofs contribute to the local management of surface water by absorbing and dissipating water. In addition, they can increase biological diversity. Intensive roofs absorb more rainwater and offer greater biodiversity than extensive roofs and are therefore given more points.

### *Urban gardening*

Opportunities to grow edible plants are a way to increase knowledge about sustainable lifestyles and food cultivation, create social meeting places and contribute to self-sufficiency. They can also contribute to less food waste and transportation.

### *Gardens with rich biodiversity*

Flower meadows, perennial beds, multi-layered vegetation, and less monoculture create more diversity of insects, birds and animals. Local species can help to create cohesive habitats where insects, animals and birds can move both on the plot itself and through a larger urban area.

### *Habitats*

Creating habitats for insects, birds, bats, flying squirrels and amphibians encourages diversity in the garden.

### *Local management of surface water and collection of water for irrigation*

Local surface water management prevents flooding and protects local water sources, by ground infiltration, retention, or dissipation. Measures such as open waterways and ponds with natural banks, rain beds and moisture habitats also contribute positively to biodiversity.

Water systems that collect water for local irrigation helps minimizing water usage.

### *Permeable surfaces*

Permeable surfaces are important for protecting local water sources, absorbing surface water, and reducing floods. Permeable surfaces are a prerequisite for planting the varied vegetation that creates greater biodiversity. The surfaces can be anything from soil with grass or garden plants, which is most permeable, via stone slabs with grass in between, to gravel, which is less permeable.

### *EU taxonomy DNSH 6.2*

Evaluating and confirming the buildings compliance with this requirement is rewarded 2 points.

### *Bird friendly glass facades:*

When the building is designed to have bird friendly glass facades it is rewarded. All glass railing used on terraces and balconies in the building/project must be endowed with inherent properties that reduce the risk of bird collisions i.e., UV-patterned glass, window films, frit or acid-etched patterns on glass, opaque and translucent glass that is etched, stained, or frosted.

### *Habitats for insects, birds, mammals and ecological corridors:*

To preserve and promote the local biodiversity it is essential to promote local habitats and corridors that can link otherwise separate habitats.

### *Light pollution:*

Light pollution can have a negative impact on diversity of insects, birds, and animals in addition to preventing people from seeing the night sky. Light sources must be planned, designed, and placed in locations where they are used only for the purpose of guiding people safely. Glare and too much light can also be negative for safety in the form of excessive contrasts.

## 11 Indoor environment

### O34 Acoustics (Educational and office buildings)

Calculated sound levels and design sound classes in the building project must comply with the limit values given for each type of building below. Compliance is verified through an acoustic plan showing calculated sound levels and designed sound classes.

The acoustic plan must be performed by an acoustic technician with minimum 2 years' experience within designing building acoustics.

#### ***Educational buildings***

**Denmark:** Reverberation time, airborne sound insulation and noise from technical installations must fulfil the levels defined in BR18.

**Finland:** Building type specific guideline values given in the Ministry of the Environment's guide to the sound environment of a building, 2018 (based on Decree 796/2017) for weighed standardised level difference  $D_{nT,w}$  and for weighted standardised impact sound pressure level  $L'_{nT,w} + C_{L,50-2500}$  must be fulfilled. Noise class for reverberation time shall be class B according to SFS 5907:2004 or corresponding later standard.

#### **Iceland (according to IST 45):**

- Schools: Sound class C for reverberation time.
- Preschools: Sound class B for reverberation time and another optional sound environment parameter. Other sound environment parameters must comply with class C.

#### **Norway (according to NS 8175):**

- Schools: according to national legislation.
- Preschools: Sound class B for reverberation time and another optional sound environment parameter. Other sound environment parameters must comply with class C.

**Sweden:** Buildings must fulfil the essential sound class requirements for all parameters assessed according to the valid national sound class standard SS 25268.

*Rooms that are occupied temporarily (such as hallways, corridors, bathrooms, changing rooms) are exempt from the requirement. For safety reasons, each preschool section is viewed as one room in relation to evaluation of the airborne sound insulation parameter.*

#### ***Office buildings***

**Denmark:** Reverberation time, airborne sound insulation, indoor noise from traffic, and noise from technical installations must fulfil the guideline levels given in "Bygningsreglementets vejledning om lydforhold, vejledning for kontorbyggeri", BR18.

**Finland:** Building type specific guideline values given in the Ministry of the Environment's guide to the sound environment of a building, 2018 (based on Decree 796/2017) for weighed standardised level difference  $D_{nT,w}$  and for weighted standardised impact sound pressure level  $L'_{nT,w} + C_{I,50-2500}$  must be fulfilled. Noise class for reverberation time shall be class B according to SFS 5907:2004 or corresponding later standard.

**Iceland:** Sound class B for reverberation time and another optional sound environment parameter. Other sound environment parameters must comply with class C (According to IST 45).

**Norway:** According to national legislation.

**Sweden:** Working spaces such as cellular offices, open floor plan offices, telephone booths and conference rooms must fulfil all additional requirements according to the valid national sound class standard SS 25268.

*Rooms that are occupied temporarily (such as hallways, corridors, bathrooms, changing rooms) are exempt from the requirement.*

- Acoustic plan that shows calculated sound levels and designed sound classes in the building project.
- Competence description of the acoustic technician such as CV.

## Background

Poor acoustics give a high noise level and a poor learning or working environment with negative influence on both physical and mental health. Concentration, understanding of speech, memory capacity and comprehension are all negatively affected if acoustics are poor. Reverberation time is especially important in offices, schools and day-care centres.

While acoustics are important for occupant health and productivity, there is a balance to maintain between a good acoustic environment and material resource use.

Nordic Ecolabelling has set requirements for the acoustics in educational and office buildings. The requirement is differentiated between the different Nordic countries, due to the differences in scope, methods and threshold values in the acoustic standards and national legislation.

Acoustic environment parameters are: Airborne sound insulation, impact sound insulation (step sound insulation), room acoustics (reverberation time), indoor sound level from technical installations, indoor sound level from outdoor sources and noise levels in outdoor living areas.

The requirement must be verified via an acoustic plan – a document often created in the project design phase – showing calculated sound levels and designed sound class. The acoustic plan must be performed by an acoustic technician or another person with equivalent competence. A minimum experience of 2 years is required.

## P21 Quality assurance of acoustics

For all building types, control measurements of any acoustic parameter in accordance with obligatory requirement O34 (or national legislative level for residential buildings) gives 1 point. Maximum 1 point can be achieved.

If deviations from the projected/calculated values are found, the relevant issues in the construction must be dealt with. Documentation must be sent to Nordic Ecolabelling.

The choice of relevant acoustic parameter(s) and the extent of the conducted measurements must be defined by the acoustic technician to ensure their relevance.

Measurement methods must be in accordance with national legislation, national standards, or national industry guidelines (e.g. Denmark: SBI-anvisning 217 Udførelse af bygningsakustiske målinger, Norway: NS-EN ISO 16283-1:2014).

- ☒ Results of the control measurements of relevant noise parameters, including description of measurement methods and reasoning for the controlled rooms/areas.
- ☒ Documentation of corrections to deviations from the projected values, if relevant.

## Background

Control measurements of acoustic parameters are an effective tool to find and correct mistakes during construction. Building mistakes in relation to acoustics can be very difficult to correct once the building has been taken into use. Nordic Ecolabelling wishes to encourage contractors to conduct control measurements to ensure the quality of the building. Points can be granted for all building types, including residential buildings.

Measurement methods must be in accordance with national legislation and/or national industry guidelines (Denmark: SBI-anvisning 217 Udførelse af bygningsakustiske målinger, Norway: NS-EN ISO 16283-1:2014).

## O35 Daylight provision

Daylight provision in the Nordic Ecolabelled building must be evaluated through computer simulations, using one of the two methods described in CEN 17037, Target daylight factor or Target illuminance.

At least 50% of the utilised area in a room must meet the target illuminance level or target daylight factor. For definitions and details about the methods and input values, see Appendix 12.

### *Residential buildings*

The applicant shall demonstrate that the daylight provision in the common living areas fulfils the requirement shown in Table 29. Common living areas are defined as spaces intended for gathering, dining, watching television, etc.

All residential units must fulfil the requirement, which is shown through simulations. If the residential building has communal areas functioning as common areas, these communal areas must fulfil the requirement.

Finland: All bedrooms must as a minimum have one window.

For apartment buildings or identical single-family houses, townhouses, or multi-family houses, simulations of a selection of the residential units ( $\geq 5$  units) that risk not reaching the target levels are accepted. The selection should be justified.

**Table 29 Minimum levels for target illuminance level and target daylight factor for each country in residential buildings.**

Nation	Target illuminance level	Target daylight factor (DT)
Denmark	200 lux	1.4%
Sweden	120 lux	1.0%
Norway	200 lux	1.6%
Finland	150 lux	1.1%
Iceland	150 lux	1.3

*It is accepted that one apartment or  $\leq 5\%$  of the apartments in a building project only reaches 80% of the mandatory level if it can be documented by a daylight expert (minimum 3 years' experience with daylight simulations) that no further reasonable improvements can be done in the floor plan, exterior architectural elements, window sizes and glazing, interior and exterior colouring, and material changes.*

### Screening for risk of overheating in residential buildings

In connection with the daylight simulations, rooms with risk of summertime overheating must be identified. Rooms with windows facing  $45^\circ$ - $315^\circ$  with either  $DT > 4\%$  or  $AF^* > 25\%$  must be evaluated for risk of overheating. Note that residential buildings designated for elderly people requiring care is covered by O36, and therefore exempted from this screening.

If solar shading, solar film or other measures for lowering indoor temperature are prescribed, the prescribed measures must be implemented before the building is taken into use. See appendix 12 for limit values and evaluation methodologies accepted.

$$* \text{ Area factor } AF = A_{\text{glazing}} / A_{\text{floor}}$$

### Educational buildings

The applicant shall demonstrate, through computer simulation, that the daylight provision achieved for each of the common areas, which include common rooms/playrooms, classrooms as well as areas for group working and studying, fulfils the requirement shown in Table 30.

Areas used only for transient activity and areas with specific lighting requirements are excluded, as shown in Table 31.

In pre-schools situated on the ground floor in apartment buildings where the daylight is restricted by the surroundings, common rooms/playrooms



shall fulfil either the Daylight Factor and/or the Daylight Provision requirement in the relevant country's building code.

### ***Office buildings***

The applicant shall demonstrate, through computer simulation, that the daylight provision achieved for the workplace areas fulfils the requirement shown in Table 30. Areas used only for transient activity, and areas with specific light requirements are excluded, as shown in Table 31.

**Table 30 Minimum levels for illuminance and daylight factor for each country in educational buildings and offices**

Nation	Target illuminance level	Target daylight factor (DT)
Denmark	300 lux	2.1%
Sweden	300 lux	2.5%
Norway	300 lux	2.4%
Finland	300 lux	2.2%
Iceland	300 lux	2.6%

**Table 31 Areas excluded from the requirement**

Areas excluded from the simulations
Sports facilities and gymnasiums
Auditoriums
Music rooms
Areas with special security needs, such as rooms for technical work or laboratories
Rooms for health care, dental care, etc.
Offices for teachers and staff room
Conference rooms
Canteens
Libraries
Professional kitchens
Rooms for vocational education and training such as workshops, kitchens, etc.
Bathrooms
Changing rooms
Lobbies, stairways and corridors
Other rooms with special needs that may be exempted from this requirement need to be approved by Nordic Ecolabelling

- ☒ Description of the selection of the simulated units (worst-case units for each project) in residential buildings. Description of the selection of common areas in educational buildings or the workplace areas in office buildings.
- ☒ Floor plans of the evaluated rooms. Areas subject to the requirement should be marked.
- ☒ Situation plan for the building, showing obstructing elements that affect daylight provision. Vegetation should not be accounted as daylight obstruction within this requirement.

- ☒ Picture from the daylight model, showing shading objects corresponding to the situation plan.
- ☒ List of reflectance values used in the simulation. Documentation from the manufacturers of the surface materials showing reflectance values.
- ☒ Results of the computer simulation for either Method 1 or Method 2.
- ☒ Results of screening for  $DF > 4\%$  and  $AF > 25\%$ , and proof of compliance with temperature recommendations if relevant.

## Background

Urban densification, maximisation of leasable space and increased energy efficiency tends to limit the exposure to daylight. Buildings are regularly being constructed in which most of the occupiable rooms do not fulfil the minimum statutory requirements concerning daylight. Nordic Ecolabelling wishes to inspire the construction of new buildings that deliver appropriate levels of daylight, since daylight creates a good indoor environment and promotes health and general well-being. The Nordic population risks not getting enough daylight, due to spending 90% of their time indoors. The consequences are long-term health problems such as disturbed sleep, seasonal depression, and diabetes<sup>35</sup>. Studies show that daylight increases productivity<sup>36</sup> and improves student performance.

Most of the Nordic countries have a requirement for daylight in their national building codes, but the content of their legislation differs. That, together with cultural and architectural differences, makes it difficult to compare daylight expectations across the Nordic countries. The access to daylight must be balanced with concern for summer thermal comfort and energy use. Therefore, this requirement must be understood as part of a whole approach for improving the quality of the indoor environment.

### O36 Thermal comfort and overheating

This requirement applies to office buildings, educational buildings and residential buildings designated for elderly people requiring care.

Rooms that risk overheating must be identified and evaluated for compliance according to Tables 32 and 33. This must be verified through dynamic simulations with minimum one hour resolution of the average operative temperature on a room basis during the months from April to October. Parameters for the simulation are given in Appendix 12.

Prescribed solar protection such as awnings, blinds, venetian blinds, or solar film must be installed by the time of moving in.

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<sup>35</sup> Rogers, Paul; Tillberg, Max; Bialecka-Colin, Ewa et al., 2015, Vad innebär BBR God tillgång till direkt dagsljus? (Implications of BBR Good access to direct daylight?) – SBUF report 12996.

<sup>36</sup> Figueiro, Rea, Stevens & Rea, 2002, Daylight and productivity – A possible link to circadian regulation. Light and Human Health EPRI/LRP 5th International Lighting Research Symposium, California.

Rooms not intended for habitation/occupancy, such as bathrooms, hallways, corridors, stairwells, and storage and maintenance rooms are exempt from the requirement.

Operative temperatures\* can exceed the following values only for a limited number of hours per year, as given in Tables 32 and 33:

**Table 32 Long-term operative temperatures**

Long-term operative temperatures		Denmark	Finland	Iceland	Norway	Sweden
Office buildings	Temperature, °C	27	25	26	26	26
	Max time, h	100	150	100	50	100
Educational buildings	Temperature, °C	26	25	26	26	26
	Max time, h	100	150	100	50	100
Residential buildings for elderly persons requiring care	Temperature, °C	26	26	26	26	26
	Max time, h	100	150	100	50	100

**Table 33 Short-term operative temperatures**

Short-term operative temperatures*		All countries
Office buildings	Temperature, °C	28
	Max time, h, within the hours given in Table 21	25
Educational buildings	Temperature, °C	27
	Max time, h, within the hours given in Table 21	25
Residential buildings in the relevant categories	Temperature, °C	27
	Max time, h, within the hours given in Table 21	25

\* Instead of temperature simulations, PPD simulations can be used with the following thresholds: PPD<10% corresponds to 26°C, PPD<15% corresponds to 27°C and PPD<20% corresponds to 28°C. Simulations must be done in accordance with EN ISO 7730, and parameters in Appendix 13 should be used.

- Description/motivation of how the rooms that risk overheating were chosen.
- Calculations of the average operative indoor temperature for the chosen rooms, based on dynamic simulations.
- Drawings of the buildings indicating the chosen rooms.

## Background

Thermal comfort impacts health, productivity, and stress levels. With well insulated buildings and a warming climate, overheating is becoming a common problem. The longer and more frequent heat waves with higher temperatures result in heat stress which costs human lives and health, especially among the elderly.

The requirement for thermal comfort ensures acceptable temperature levels across the whole year. The requirement is inspired by national legislation and guidelines, which are not always upheld. The requested calculations must be a set of dynamic calculations as a means of determining compliance. Reports based only on the energy calculations are not accepted.

## P22 Solar shading and energy efficient cooling technologies

1 point is granted for each of the following technologies used to control the indoor temperature. Buildings with or without a mechanical cooling system can get points. The chosen measures must be presented in context with O36 if a simulation is done. Maximum 2 points are available.

- External solar shading, provided by architectural elements such as awnings, louvres etc., or solar shading provided by vegetation. At least all windows in occupied spaces facing 90°-270° must be accounted for.
- Cooling provided by free cooling from geothermal ground source.
- Automated night ventilation.
- Other cooling technologies that do not require the installation of a mechanical cooling system might be rewarded points after discussion with Nordic Ecolabelling.

☒ Description of the chosen technical solutions.

☒ Reference to thermal comfort simulation in O36.

## Background

The warming climate is leading to longer and warmer summers in the Nordic countries. Nordic Ecolabelling wishes to reward the climate adaptation of buildings and encourage the use of passive or energy efficient technologies. Summertime overheating is a common problem in both new and older buildings, and there is a trend towards residents using air to air heat pumps<sup>37</sup> or portable air-cooling units<sup>38</sup> to lower the indoor temperature, with increasing energy use as a result. Minimising heat gains and using passive and energy efficient cooling technologies is essential to curb this trend. Evaporative cooling and cooling of the indoor air through ground pipes, “earth tubes”, are not rewarded, due to the risk of microbial growth and radon intrusion.

## O37 Radon (applies only in Finland)

Buildings in Finland must be constructed using radon safe construction methods. This requirement is not applicable in the other Nordic countries.

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<sup>37</sup> <https://www.ssb.no/energi-og-industri/artikler-og-publikasjoner/stadig-flere-anskaffer-varmepumpe>

<sup>38</sup> <https://www.market.se/affarsnyheter/forsaljning/rusning-efter-flaktar-i-varmen-trodde-inte-att-intresset-kunde-bli-mycket-storre/>

- ☒ Description of the radon safe construction methods used.

## Background

Long-term exposure to radon gas can cause lung cancer. The purpose of this requirement is to ensure very low radon levels in buildings.

In Finland authorities require that buildings shall be designed and built in a way that the radon concentration does not exceed value 200 Bq/m<sup>3</sup>. There are, however, large regional differences in radon prevention work and differences in municipalities' radon prevention requirements in building permit process. The entire country is a risk area for radon and for this reason Nordic Ecolabelling wants to ensure the use of radon-safe construction methods in Finland.

The Icelandic Radiation Safety Authority conducted a survey in 2014, measuring radon concentration on the ground floor or in the basements of 250 homes around Iceland<sup>39</sup>. The results indicate that the radon concentration in Iceland is very low. Based on these results, Nordic Ecolabelling concluded that Iceland should be exempted from the requirement.

According to the Norwegian legislation, buildings must always be constructed according to radon-proof design principles. No verification is required by Nordic Ecolabelling, as this is always evaluated by the authorities.

Denmark has the lowest official threshold limit for radon in the Nordic. In addition, mapping of the local radon levels is publicly available thereby forming the basis for proper risk assessments and handling. The national legislation and the compliance with it is considered to be unproblematic for New Buildings. The Nordic Swan ecolabel cannot make a difference here which is why the requirement does not apply in Denmark.

In Sweden, Boverket<sup>40</sup> states that it is the developer's responsibility to ensure that the new building complies with the national threshold level of radon in indoor air. The choice of technical solutions to achieve the threshold limit is left to the developer, and radon protective measures must be followed up in the control plan. Radon mapping is available, to aid in the risk assessments. Nordic Ecolabelling has concluded from documentation in criteria generation 3 that radon proofing measures are taken when relevant, and Nordic Ecolabelling cannot make a difference in fulfilment of the threshold limit. Therefore, the requirement does not apply to Swedish buildings.

## 12 Innovation and other green initiatives

### P23 Innovation and other green initiatives

Points are given for innovative measures taken in the construction process or in direct relation to the Nordic Ecolabelled project. A

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<sup>39</sup> Óskar Halldórsson, Sigurður M. Magnússon, Róbert Karl Lárusson, Gísli Jónsson, July 2014, Styrkur radons í húsum á Íslandi (<https://gr.is/wp-content/uploads/2016/09/GR-1401Styrkur-radons-i-husum-a-Islandi.pdf>)<sup>40</sup> <https://www.boverket.se/sv/byggande/halsa-och-inomhusmiljo/radon/nybyggnation/>

<sup>40</sup> <https://www.boverket.se/sv/byggande/halsa-och-inomhusmiljo/radon/nybyggnation/>

maximum of 3 points can be achieved. The list below shows the measures that are awarded points.

- a) A minimum of 90% of the main brick walls are built using lime mortar or other types of mortar that allow bricks to be easily disassembled. Documentation for disassemblability must be provided for mortar types other than lime mortar. 2 points.
- b) Point foundation or ground screw foundation of minimum 50% of the foundation area of the Nordic Swan Ecolabelled building gives 1 point.
- c) Point foundation or ground screw foundation of minimum 75% of the foundation area of the Nordic Swan Ecolabelled building gives 2 points.
- d) Minimum 25% of the certified wood (according to O30) comes from forest managed according to the principles of close-to-nature forestry/ continuous-cover forestry \*. 1 point.
- e) Minimum 50% of the certified wood (according to O30) comes from forest managed according to the principles of close-to-nature forestry/continuous-cover forestry\*. 2 points.
- f) Communal laundry rooms that have installed cleaning technology that removes at least 50 weight% of microplastic\*\* emitted into wastewater. 1 point.
- g) Other measures may be accepted after consideration by Nordic Ecolabelling.

*\* Forests that are managed according to the principles of close-to-nature forestry with forests of different ages. There are several models, but the common feature is that forestry is run without clear-cutting, with trees of different ages and local species. The forest must have an operating plan showing how it is managed and renewed, and that clear-cutting is not done. Invoices or other documentation which shows the wood used in the building can be traced directly to the forest.*

*\*\* Microplastics: particles less than 5 mm of insoluble macromolecular plastic obtained by any of the following processes:*

- a) Polymerization such as polyaddition or polycondensation or similar process using monomers or other starting materials.*
- b) Chemical change of natural or synthetic macromolecules.*
- c) Microbial fermentation*

- a) Documentation of the mortar used and the relative amount used in the project.
- b) & c) Documentation of the principle used for the point foundation or ground screw foundation.
- d) & e) Valid operating plan showing that the forest property is managed according to the principles of close-to-nature forestry.

- ☒ d) and e) Verification that the wood is covered by valid chain of Custody certificate issued by FSC or PEFC
- ☒ d) and e) Invoice or other documentation which shows that the specific wood used in the Nordic Swan Ecolabelled building can be traced back directly to the forest.
- ☒ f) Confirmation / datasheet from the supplier of the cleaning technology on installation and cleaning effectiveness regarding microplastics from laundering textiles.

## Background

Specific measures that can document a significant contribution to a reduced environmental or climate impact or that contribute to circularity in the building sector are rewarded in this requirement. Measures other than those listed may be accepted after consideration by Nordic Ecolabelling.

The use of lime mortar or other types of mortar that allow for bricks to be easily disassembled is rewarded. This means that bricks can also be reused in the future.

A point foundation or ground screw foundation for the Nordic Swan Ecolabelled building ensures minimum use of concrete/cement, thereby minimising the climate impact of the project.

Forestry close to nature without clear-cutting helps to preserve biodiversity in the forest. There are several models, but the common feature is that forestry is conducted without clear-cutting, with trees of different ages and local species. According to the UN's Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), it is absolutely essential to get biodiversity back into the production landscapes. This means, among other things, less monoculture, and forestry close to nature is one way to achieve this.

Filtering of wastewater from laundry equipment has a potential to reduce the spread of microplastics as well as natural fibre fragments to the recipients.

## 13 Quality management of the construction process

### O38 Air permeability

The applicant must have routines to test air permeability/airtightness based on the standard EN ISO 9972, or alternative method referred to in national building legislation, in order to ensure the performance that is set at the design stage.

The routines must include defect analysis and corrective measures in cases where the projected air permeability is not achieved. The tests and follow-up based on the routines must be documented in the contractor's self-monitoring system (O42).

*In countries where the building legislation does not require measurement of all buildings/units, the air permeability must be measured for all single-family houses, office buildings and educational buildings. For apartment buildings and*

*town houses at least 10% of the total number of residential units must be measured, the units tested must be representative for the building. Both measurements of individual apartments and entire staircases are approved methods. When air permeability is measured on a random sample basis, there must be a routine to ensure that other apartments have equivalent air permeability. In projects that comprise more than one building, apartments from each building need to be measured.*

- ☒ Routine(s) to measure air permeability, comprising measurement method, corrective measures, and error analysis when the measured value deviates from the designed value.
- ☒ Results of the air permeability tests and comparison with the air permeability value used in the energy calculation (O3) must be declared to Nordic Ecolabelling upon request.

## Background

A building's air permeability affects its heat losses to the outdoor environment, as well as the spread of odours between apartments and into the stairwell. Air permeability testing allows comparison between the result and the projected value and is therefore an important quality indicator. Routines must exist to perform air permeability testing and to take corrective measures.

When accepted in national building legislation it is possible to test only part of the residential units in apartment buildings and town houses. Standardised buildings have been removed from this exemption because there is no evidence that this way of constructing buildings has an influence on the air permeability.

The requirement is part of the documentation for alignment with the EU Taxonomy (7.1.1.2: Air tightness). See section on the EU Taxonomy for details.

## O39 Moisture prevention

Moisture prevention in the building must be documented in line with sections A to C.

*Proof of adherence to relevant national industry standards can be used as part of the documentation.*

### A. Plan for moisture prevention

A plan for moisture prevention must be submitted to Nordic Ecolabelling before construction work begins. The project-specific plan for moisture prevention must include:

- List of relevant moisture-sensitive materials and constructions.
- Weather protection of materials/elements during transport and storage.
- Plan for closure of the building and weather protection of relevant constructions.
- Description of procedures and methods for drying out the building.



- Description of how it is ensured that subcontractors adhere to applicant's moisture prevention plan.
- Description of the requirements set for manufacturers of prefabricated elements/modules in relation to moisture prevention during manufacturing, transport and installation.
- Description of design and quality measures in water and sewage installations, reducing the risk of damage by drip leakage during the building's use phase.

## **B. Plan for moisture measurements**

A plan for moisture measurements must be made according to the following:

- Moisture measurements must be performed for all relevant materials and constructions in the building, according to the national legislation or official guidelines. The relevant structures and materials must be listed in the plan.
- In concrete-based materials that are covered by moisture-sensitive materials (e.g., parquet) the relative humidity must be verified by borehole/specimen measurements.
- Measured values must be below requirements from the manufacturer of surface materials (e.g., linoleum, parquet, etc.) or official national industry guidelines. Relevant target values must be stated.
- Measurement results must be documented and be available to Nordic Ecolabelling upon request.

## **C. Coordinator for moisture management**

A moisture coordinator must monitor adherence to the moisture prevention plan. The coordinator must be educated in moisture prevention in buildings and have at least 2 years' experience in construction site moisture management/control or moisture damage investigations.

- A. Plan for moisture prevention.
- B. Plan for moisture measurements.
- B. Monitoring reports and measurement results must be available to Nordic Ecolabelling upon request.
- C. Competence description of the moisture coordinator such as CV.

## **Background**

Moisture problems in buildings have environmental, health and financial effects. A building's lifetime might decrease due to moisture problems, with an increased need for renovations. Moisture in buildings increases the risk of respiratory infections and illness such as asthma and respiratory irritation.

Exposure of construction materials to moisture can lead to mould and increased emissions of volatile chemical substances. Timber structures and concrete slabs must be sufficiently dry before further installation of the surface layer. Materials and construction elements must be sufficiently weather protected during transport to the construction site and storing at the construction site. The building and its water- and sewage installations must be designed to minimise the risk of water damage from drip leakage.

Moisture measurements are needed to ensure compliance with the target values required by the manufacturer of the surface material. Surface moisture measurements are not sufficient to determine whether the concrete slab is dry enough, hence borehole/specimen measurements are required.

#### O40 Compliance with material and chemical requirements

The licensee must ensure fulfilment of all material and chemical requirements. A routine must be established for the whole construction process, including:

- Division of responsibilities for the material requirements (O7-O9 and O13–O27) in the design phase, construction phase(s) and procurement.
- Instructions for subcontractors, e.g., via agreements and control plans.
- Procedure for construction site inspections that covers:
  - Frequency of internal inspections/rounds during the construction period
  - Extent of the internal inspections (minimum: material storage, active construction site and area for construction waste).
  - Documentation for internal inspections: inspected materials and their compliance with material requirements in the criteria must be documented, e.g., in the self-inspection system or inspection reports.

Routines that as a minimum document the bullets above.

Inspection reports must be documented and be available to Nordic Ecolabelling upon request

#### Background

The requirement is intended to ensure fulfilment of the chemical and materials requirements at various stages of the process, and between the different parties involved. Many questions may arise during the process. How should communication take place? Who requests attestation of products and chemicals, and how early? Who must be informed when products do not fulfil the requirements and approve any cost increases or delays? How should reconciliations be made? This requirement ensures that these questions are

assessed early in the process by defining a set of routines that will contribute to improving control over the chemicals, materials and construction products used in the project.

#### O41 Information for those involved in the construction process

Employees involved in the construction process, including supervisors, site managers, project leaders, procurement manager, subcontractors etc., must have the relevant knowledge to be able to ensure fulfilment of the requirements in conjunction with the project design and construction of a Nordic Swan Ecolabelled building.

The routines for the training and information programme must include at least the following:

- Content and scope of the training/information, depending on the participant's role.
- Frequency of the training/information.
- Division of responsibilities.

The applicant must ensure that training and information are available in relevant languages.

- Routine in the quality management system and training programme.
- List of participants that have completed the training programme must be available.

#### Background

The requirement covers the need for the licence applicant to define the training programme, showing the content and scope of the training/information. The aim is to provide information on the Nordic Ecolabelling requirements and how the requirements can affect standard processes and routines. All employees, supervisors, site managers, subcontractors and subsuppliers involved in the construction of a Nordic Swan Ecolabelled building must have the relevant knowledge to be able to ensure fulfilment of the requirements in conjunction with the project.

#### O42 The contractor's self-monitoring system

In order to ensure compliance with the building legislation the contractor must have a documented robust quality self-monitoring system during the entire construction period. As a minimum, the self-monitoring system must include routines for:

- Overview of chain of responsibility for the control measures
- System for management of documents, including archiving and revised versions of drawings
- System for checks on deliveries at time of receipt

- System for process control, defining control levels and frequency of control for subcontractors, consultants and the construction site management
- The license holders' procedures for control of the quality of the prefabricated elements and compliance with the requirements of the Nordic Swan Ecolabel
- Procedure for the final inspection (municipality and internal inspection) and handover of the building

Nordic Ecolabelling must have access to the quality self-monitoring system through the entire construction process. This can be handled in the contractor's digital quality assurance system or manually at audits.

- ☒ Routines describing the self-inspection system according to the requirement.

### **Background**

The requirement aims to ensure a solid quality self-monitoring system for the construction of the Nordic Swan Ecolabelled building. The focus is on documentation, communication, and inspection through the construction period. The requirement is designed to include the most critical elements in a typical best-practice self-inspection system in the Nordics.

## 14 Changes compared to previous generation

**Table 34 Overview of requirement changes in generation 4 compared with generation 3.**

Table 35 Generation 4		Generation 3		Change
No	Name	No	Name	
O1	Overall description of the building and the plot	O1	Overall description of the building	Updated and adjusted requirement. Appendix is created for the requirement.
		O2	Responsibility for Nordic Swan Ecolabelling	Removed. Included in the Nordic Ecolabelling portal.
O2	Points achieved	O3	Points achieved	Updated according to Generation 4's point system.
O3	Energy demand of the building	O4	Energy consumption of the building	Threshold limits are updated and requirements for Iceland and Faroe Islands are added.
O4	Lighting management	O5	Lighting management	Indoor demand control must be based on both daylight and presence. Outdoor lighting must be directed to the ground.
O5	Energy efficient white goods	O6	Energy-efficient white goods	Stricter limits have been introduced. Updated according to Energy Labelling Regulation 2017/1369. Products for professional kitchens have been introduced, together with requirements for drying cabinets. Integrated white goods now have separate requirements.
P1	White goods of better energy class	P4	White goods of better energy class	Points for professional white goods are introduced.
P2	Water saving sanitary tapware (educational and office buildings)	P5	Energy efficient sanitary tapware	New point requirement for office and educational buildings aimed at alignment with the EU taxonomy
P3	Energy efficient and water saving sanitary tapware and technologies			Stricter limits for points. Introduction of systems that reuse greywater or rainwater for toilet flushing.
P4	Management of electricity demand and power peaks	P1	Individual metering of domestic hot water	New requirement. Individual metering of domestic hot water has been removed.
P5	Local renewable energy generation and energy recovery	P5	Local energy sources and energy recovery	Adjustment of threshold limits for solar panels and solar collectors. Introduction of liquid-to-water heat pumps outside district heating areas.
O6	Climate calculation of the building	P3	Calculation of HWC losses (and buildings' climate imprint, only available in Finland)	New obligatory requirement on climate declaration of the building.  Calculation on HWC losses has been removed.
P6	Quality assurance of the climate calculation			New point requirement
P7	Assessment of risks in a changing climate			New point requirement A climate risk and vulnerability analysis of the building should be performed.
P8	Adaptation to a changing climate			New point requirement Climate adaptation measures implemented according to climate risk analysis will give points.

O7	Cement and concrete			New obligatory requirement
O8	Steel production			New obligatory requirement
O9	Aluminium production			New obligatory requirement
P9	Construction site fuel restrictions			New point requirement
P10	Construction site machinery			New point requirement
P11	Bicycle transport	P14	Green initiatives	Parts regarding bicycle transport are now in separate requirement.
O10	Construction waste management	P13	Recycling of building waste	New obligatory requirement with stricter limits than P13 gen. 3.
P12	Construction waste optimisation			New point requirement
P13	Construction waste reduction			New point requirement
P14	Producer take-back systems			New point requirement
O11	Waste sorting inside the building	O7	Possibility of sorting waste	Office buildings added and stricter requirement level.
		O25	Recycled materials in doors, windows and facade panels	Steel and aluminium windows worked into requirements O8 and O9. PVC windows worked into O21
O12	Hazardous substances in reused construction products and materials	P12	Recycled or reused materials in construction products	Obligatory requirement regulating chemical substances in reused products.
P15	Reused construction products and materials	P12	Recycled or reused materials in construction products	More points available and new calculation method for relevant amounts.
P16	Insulating materials made from renewable sources			New point requirement
P17	Renewable carcass, facade or inner walls	P7	Timber structure	Minor clarifications
P18	Design for disassembly and adaptability			New point requirement
O13	Logbook	O15	Product list and logbook of the building	Clarification about the logbook being subject to updates along the construction process. Clarification that the logbook must be handed to the building owner.
O14	Classification of chemical products	O16	Classification of chemical products	Classification H317 has been added. The classification H410 has been added as exemption for acrylic floor and chemical anchors due to a new classification of a peroxide.
O15	CMR substances	O17	CMR substances	Updates due to changed classification of substances or changed legislation.
O16	Preservatives in indoor paint and indoor varnish	O18	Preservatives in indoor paint and indoor varnish	Updated limits for total preservatives due to changed classification of substances.

O17	Preservatives in other chemical products intended for indoor use	O19	Preservatives in other chemical products intended for indoor use	Specific limits for isothiazolinone compounds have been removed since this is regulated by the classification H317 on the chemical product itself.
O18	Prohibited substances	O20	Other excluded substances	Updated definition of substances considered to be potential endocrine disruptors. The exemption for the phthalates DINP DIDP and DIUP is being removed. Due to raised impurity limit (from 100 ppm in end product to 1000 ppm) some exemptions have been removed. Exemption of organotin compounds has been updated
O19	Nanoparticles in chemical products	O21	Nanoparticles in chemical products	Exemption regarding synthetic amorphous silica and calcium carbonate has been clarified
O20	Halogen free cables			New obligatory requirement
O21	Surface layers on floors, ceilings, walls doors and windows	O24	Surface layers on floors, ceilings and walls	Exemption introduced in professional kitchens and in wet rooms in educational buildings and homes for the elderly.
O22	Durable wood for outdoor use	O29	Durable/resistant wood for outdoor use	Introducing new exemptions for the use of preservative treated wood. Requirement on the durability of durability treated wood.
O23	Copper	O26	Copper in tap water pipes and as facade and roofing material	Introducing an exemption where fire regulation requires copper pipes.
O24	Plastic and rubber surfaces on playgrounds and outdoor areas			New obligatory requirement
O25	Excluded substances in construction products, construction goods and materials	O22	Excluded substances in construction products, construction goods and materials	Basically unchanged. Text clarified. Exemptions for fire protected EPS/XPS have been removed.
O26	Antimicrobial surface treatments	O23	Nanoparticles and antibacterial additives in construction products and construction goods	The responsibility to check material compliance now lies with the applicant.
O27	Formaldehyde emissions	O14	Formaldehyde emissions	The requirement has been harmonised with Nordic Swan Ecolabelled furniture and fitments. Laminates have been added. Previously it was only products containing more than 3% by weight formaldehyde-based additives, but that limit has been removed.
O28	Ecolabelled products	P9	Ecolabelled construction products	Obligatory minimum points introduced, nationally adapted.
P19	Ecolabelled products	P9	Ecolabelled construction products	The point requirement introduces a table which is used for calculating points.
O29	Tree species with restricted use	O27	Tree species not permitted to be used in Nordic Swan Ecolabelled buildings	Goes from a ban to restricted use of tree species. Reference to new tree list from 2020.
O30	Wood and bamboo, traceability and certification	O28	Wood raw material	An alternative way to documentation was added, using lists from the suppliers instead of invoices. More constructions elements are added to the requirement.

O31	Assessment of the biodiversity on the project area			New obligatory requirement
O32	Measures to preserve and improve the biodiversity			New obligatory requirement
O33	Management plan for the biodiversity			New obligatory requirement
P20	Biodiversity measures and ecosystem services	P14	Green initiatives	Parts of P14 in generation 3 in combination with new elements.
O34	Acoustics (Educational and office buildings)	O12	Noise environment	Obligatory for educational and office buildings. Updated levels and references to standards.
P21	Quality assurance of acoustics			New point requirement
O35	Daylight provision	O13	Daylight	Reviewed and updated requirement according to EN17037. Updated check for overheating in residential buildings.
O36	Thermal comfort and overheating			New obligatory requirement for educational and office buildings, and residential buildings designated for elderly people requiring care.
P22	Solar shading and energy efficient cooling technologies			New point requirement
O37	Radon (applies only in Finland)	O9	Radon	The requirement only applies to Finland.
P23	Innovation and other green initiatives	P14	Green initiatives	New point requirement, partly inspired by P14 in gen. 3.
O38	Air permeability	O30	Air permeability	Reviewed and updated requirement
O39	Moisture prevention	O10	Moisture prevention	Reviewed and updated
O40	Compliance with material and chemical requirements	O31	Management of requirements on products and materials	Updated and partly rewritten
O41	Information for those involved in the construction process	O32	Information to those involved in the construction process	Updated and partly rewritten
O42	The contractor's self-monitoring system	O33	The contractor's self-monitoring	Rewritten