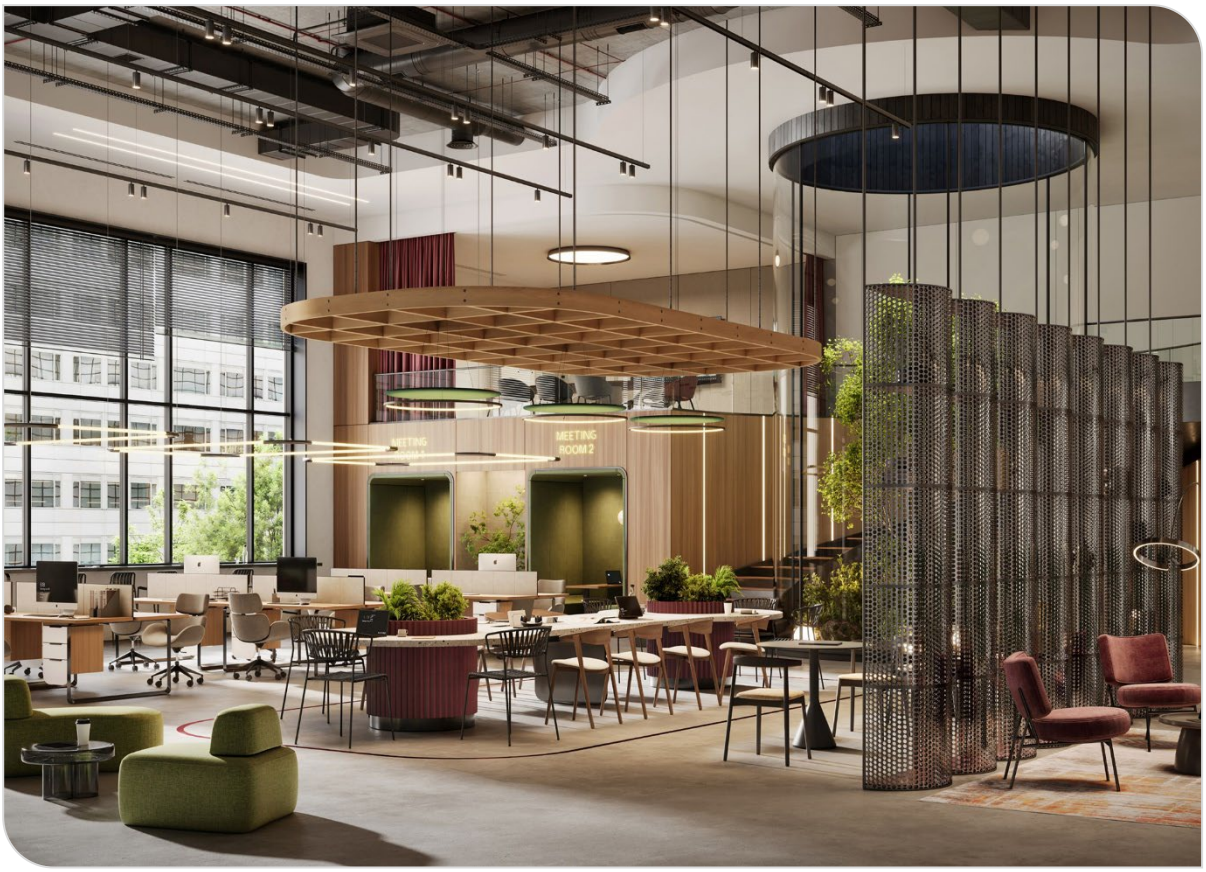
Nordic Ecolabelling for

Furniture and fitments



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Nordic Ecolabelling

Contents

031 Furniture and fitments, version 6.0, date

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

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1 Summary

The overall aim of this revision is to ensure that the Nordic Ecolabel criteria for furniture and fitments continue to have a positive environmental benefit and that the criteria are viable, market adapted and clear for the industry.

An evaluation of the criteria, generation 5, showed that most of all existing requirements are relevant and have ambitious requirement levels. The revision therefore primarily focuses on:

- Updating and tightening requirements for quality (O4 and O5) to ensure durable and safe furniture for the user.
- Updating requirements for prohibited substances to include PFAS (O22, O34, O48, O54, O66, O75, O89, O94, O141 and O150).
- Simplify the requirement for packaging by only banning the use of PVC. Ban on PVC in packaging has been moved to requirement O2 PVC.

How to read the document:

- Red text: meaning new text compared to previous version of the requirement.
- ~~Strikethrough text~~: meaning text is removed compared to previous requirements.

2 Environmental communication guideline for Nordic Swan Ecolabel furniture and fitments

Nordic Swan Ecolabel furniture and fitments have reduced environmental and climate impact throughout their life cycle. They meet strict requirements for raw materials and promote the use of renewable and recycled materials.

To minimise the product's impact on health, strict requirements are set on chemicals used in the production and on emissions related to the indoor environment. Furthermore, requirements for quality, dismantling, maintenance, repair or spare parts as well as warranty promote a long lifespan and a circular economy.

A Nordic Swan Ecolabelled furniture or fitment:

- Has a circular design that promotes repair, recycling and use of renewable and/or recycled materials.
- Has a long lifespan. This is documented through tests of strength, durability and safety.
- Meet requirements for maximum energy use in the production of wood-based panels.
- Consists of traceable and legally harvested wood. At least 70% of the wood is sourced from certified forestry.
- Meets strict requirements for chemicals. For example, halogenated flame retardants, PFAS and antibacterial agents are not allowed.

Meets strict requirements for emissions of formaldehyde and volatile organic compounds (VOC). This is positive for the indoor environment.

3 What can carry the Nordic Swan Ecolabel?

The product group include domestic furniture and contract furniture items for use in domestic or non-domestic environments. Furniture must fall into one of the following categories below:

- Furniture and fitments regulated and complying with requirement O4 such as table/desk furniture, seating furniture, sleeping furniture, storage furniture, Kitchen- and bathroom furniture, lounge furniture/mattresses, screen and partition walls, writing boards and mobile furniture ensembles and enclosures units/office pods.
- Doors and door frames for indoor use
- Sound absorption screens designed to be freestanding or mounted on tabletops
- Bathroom furniture with integrated countertop/sink

The following individual fitting:

- Countertops
- Fronts (doors and drawer fronts) for kitchens, bath and wardrobes
- Kitchen cabinets

A maximum of 5% by weight of the furniture/product may consist of materials that do not have requirements in the criteria.

Applications may also be made for product systems, e.g. kitchen and wardrobe solutions of which there are numerous variations.

To market the product as a Nordic Swan Ecolabelled kitchen, the license must include all necessary parts to assemble a finished kitchen such as cabinets, mouldings, at least one front (for cabinets or drawers) and at least one worktop.

Relevant products in addition to those specified above may be included in the product group upon request if they can be considered to be furniture/fitment products. This applies only to products made of materials for which requirements are imposed in the criteria. Nordic Ecolabelling will determine which new products may be included in the product group.

What cannot be Nordic Swan Ecolabelled

Products not primarily intended for use as furniture/fitments cannot be Nordic Swan Ecolabelled. The following are examples of products that cannot be Nordic Swan Ecolabelled under the criteria for furniture:

- Building products (e.g. walls, stairs, mouldings, windows, floors, construction panels). So-called demountable walls and/or fixed walls that can, for example, divide a room in two, where the function is equivalent to a wall, cannot be Nordic Swan Ecolabelled.
- Acoustic ceiling- and wall panels, either part of the ceiling or wall construction or which is mounted directly on ceiling or walls. This type of acoustic panels can be labelled according to criteria for 010 Panels and mouldings for interior use*.

- Sanitary ware, such as toilets, shower cabins, bathtubs and washbasins
- Lamps
- Bathroom accessories, such as soap dispensers, paper towel holders, towel racks, toilet paper holders and similar
- Office supplies
- Furniture intended for outdoor use
- Carpets, cushions/pillows** and textiles
- Toys (products that fall within the scope of the Directive 2009/48/EC on the safety of toys)
- Mirror glass that is not part of another piece of furniture/fitment
- Aids, such as raised toilet seats, armrests, backrests and similar
- Interior items, such as picture frames, candlesticks and hooks

** See https://www.nordic-swan-ecolabel.org/criteria/ Separate criteria also exist for: Carpets, floors, office supply, outdoor furniture panels and mouldings for interior use, windows, textiles and toys.*

*** Decorative cushions/pillows and pillows for sleeping must be labelled in accordance with the criteria for Nordic Ecolabelling of textiles. Other types of pillows/cushions that are a part of an overall furniture license, for example part of a sofa, can be ecolabelled under the criteria for furniture and fitments.*

3.1 Justification of the product group definition

The main environmental impact of furniture relates to the materials used to make the furniture, such as wood, plastic, metal and textiles[1],[2],[3]. Relevant environmental impacts are linked to resource use, energy consumption and carbon footprint, biodiversity and chemicals of concern. The environmental impacts during production of the actual furniture are linked to emissions of substances that are harmful to health and the environment in connection with processing the materials, gluing and surface treatment processes, and production and packaging waste. Apart from the actual materials and production process, including chemicals that are used in the furniture, there are other aspects that have effects on the environmental impact. Good quality and a longer product life have direct positive effects on the environmental impact and protect society from exposure to adverse environmental conditions related to production of new furniture. Ensuring there is possible to recycle the furniture at the end of its useful life also minimises negative impacts on the environment when the product has become worn out.

The environmental impacts related to materials, production, energy and carbon, the use phase and circular economy are described in more detail below.

[1] Shane Donatello, Hans Moons and Oliver Wolf (JRC): Revision of EU Ecolabel criteria for furniture products, final technical report, 2017
[2] Shane Donatello, Miguel Gama Caldas, Oliver Wolf Revision of the EU Green Public Procurement (GPP) criteria for Furniture, 2017, technical report final version
[3] Background document, Version 4 Furniture and fitments, Nordic Ecolabelling 2011

3.1.1 Materials

As explained above, the environmental impact of furniture is greatly affected by the materials used to produce it. The materials and additives themselves have varying environmental properties, e.g. how they are produced, energy consumption during production and what substances they contain. The materials will also affect which environmental impacts occur during the production of the actual item of furniture (e.g. emissions from lacquering/varnishing), the performance of the furniture during use (e.g. emissions from adhesives and varnish), product life span and possibilities for repair and renovation and problems that furniture can give as waste. The choice of materials therefore affects the environmental impacts at all the life-cycle stages of the furniture.

Depending on the design and type of furniture, the amount of different materials and the quantity of materials in furniture can vary greatly. The technical report from the revision of the EU Ecolabel criteria for furniture1 shows that wood is the most common material in furniture (56%), followed by metal (12%) and plastics (6%). This is much in line with the figures given in the background document for Version 4 of the Nordic Swan Ecolabel's criteria for furniture, which are based on the figures from the Swedish furniture industry; 70% wood materials, 15% padding materials (mostly polyurethane foam and polyester), 10% metals and 5% other materials (plastics, textiles, glass, etc.). This varies considerably, however, from untreated wood furniture, which can consist almost entirely of solid wood, to complex upholstered furniture and office chairs which can consist of multiple different materials and functions.

Each material can minimise negative environmental impacts in the production process, but it is also relevant to match the environmental impact of different materials against one another. Various factors will also determine a choice of material, depending on the type of furniture being produced. For example, while a shelf can be made of 100% wood, a height adjustable desk has to contain metal in order for it to function as intended. It can be difficult therefore to look at the environmental impacts related to materials without looking at the intended use and purpose of the furniture. Nevertheless, it is possible to make some general considerations about material choices.

An in-depth review carried out through studies and life cycle analyses during the previous revision for furniture shows the following general findings[4]:

- Wood has the lowest environmental impact compared with other materials such as plastic, steel and concrete.
- The total energy consumption (energy consumed in all processes associated with the production of the product) of wood is low compared with plastic and metal. The reason for this is that plastic and metal production are energy-intensive processes.
- The total energy consumed in the production of wood products is closely related to the energy expended in drying the wood.
- The incineration of wood for energy production can be regarded as CO2 neutral.
- The use of other materials (even in small quantities) in the production of wooden furniture (such as metals, plastics, glue, varnish etc.) dramatically increases the environmental impact of furniture.

[4] Nordic Ecolabelling's background document for Version 4 of the criteria for furniture and fitments, 2011

The Danish Environmental Protection Agency has published a study that looks at the environmental impact of wood and wooden furniture from an LCA perspective[5]. This study confirms the conclusions drawn above and also notes that the environmental impact of furniture can be reduced significantly if production waste and materials are recycled and/or incinerated to produce energy.

A study of different materials conducted by Bath University[6] shows that metal (aluminium, steel and stainless steel) is more energy and carbon intensive than renewable raw materials like wood, HPL and MDF. Compared with other materials, aluminium's footprint is very large, but stainless steel and steel have a smaller footprint than plastic. The study also shows that energy consumption and carbon emissions vary depending on the type of plastic. Several studies show that using recycled materials, especially metal and plastic, significantly reduces adverse impacts on the environment6,[7],[8].

Since materials and the chemicals, they contain greatly affect the environmental impact of an item of furniture, it is relevant for Nordic Ecolabelling to examine which requirements can be imposed on the production of the constituent materials in the product, chemicals used and requirements that promote the use of renewable and/or recycled materials.

The main materials most commonly used in the manufacture of furniture are wood and wood-based materials, plastic, metal, padding materials and textiles. A short description of the environmental impacts of each is given here.

Wood and wood-based materials

Wood and wood-based materials, like panels, have a high content of renewable materials. That is positive from an environmental perspective, but it is important to ensure that wood raw materials are sourced in a sustainable way. The many benefits that sustainably managed forests deliver to society include wood for materials and energy, protection against global warming, homes and livelihoods for local communities and indigenous peoples, support of biodiversity and protection of water and soil from pollution and erosion. Recycled materials can be used to minimise adverse environmental effects related to the extraction of virgin raw materials.

Chemicals, e.g. adhesives, are also used in the production of wood-based panels (including paper-based panels and boards). Surface treatment using varnishes or paints is also a relevant environmental aspect. Using chemicals with a low content of substances that are harmful to health and the environment will affect the environmental impact during production and during product use e.g. emissions.

Metal

The production of metal, including mining, is associated with significant environmental impacts relating to raw material extraction, large quantities of waste, energy consumption

[5] The Danish Environmental Protection Agency, 2001. http://www.mst.dk/Udgivelser/Publikationer/2001/11/87-7944-909-3.htm
[6] Prof. Geoff Hammond & Craig Jones, Inventory of Carbon & Energy (ICE), Version 2.0. Sustainable Energy Research Team (SERT). Department of Mechanical Engineering. University of Bath, UK, 2011
[7] Shane Donatello, Hans Moons and Oliver Wolf (JRC): Revision of EU Ecolabel criteria for furniture products, final technical report, 2017
[8] 13 SHAHZAD AHMAD * et al. ISSN: 2250–3676, INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY Volume-2, Issue-4, 871 – 875, IJESAT, July-Aug 2012

and emissions from production.[9] Ethical issues such as child labour and working conditions may also present challenges.

The use of recycled materials reduces environmental impacts significantly in all areas.[10] The surface treatment of metal uses numerous chemicals associated with adverse health and environmental effects and therefore also has significant environmental impacts.[11] The process also produces emissions and hazardous waste that must be managed and disposed of in the proper way.

Plastic

Plastics may be fossil-based or bio-based. The plastics used in furniture today are mainly fossil-based. Environmental impacts relating to extraction of fossil raw materials are therefore relevant for plastic as a material. Chemicals which may be harmful to health and the environment are added during the manufacture of plastic to give it different properties. Additives may include antioxidants, flame retardants and plasticisers such as phthalates. Dyes and colourants may also be added. The Danish Environmental Protection Agency has conducted an inventory of chemical substance use within the Danish plastics industry. Of the 1,300 chemical substances, 300 have been identified as chemicals of potential concern due to their effects on the environment and/or health.[12]

Padding materials

The term “padding materials” is used to describe a number of different materials, for example, polyurethane (PUR) foam and latex. These are the most commonly used padding materials today. Polyester or padding made of renewable materials, such as down and feathers, are also used. Production of PUR foam may present potential health and safety hazards due to the use of isocyanates which are classified as CMR (Carcinogenic, Mutagenic and Reprotoxic) and/or allergenic. Padding materials can also produce emissions of VOCs, formaldehyde and other harmful substances. The use of chemicals such as antibacterial additives or flame retardants that are classified as harmful to health and the environment is also relevant to padding materials. The use of natural filling materials may present ethical issues relating to animal welfare.

Textiles

The textile industry is one of the world’s largest industries and also one of its most polluting and resource-consuming industries. The LCA-study “Advancing life cycle assessment of textile products to include textile chemicals”, which includes the environmental impacts of chemicals, states that the greatest environmental impact from textiles is associated with the actual production of the textile. The main impacts come from the use and discharge of hazardous chemicals and the use of water and energy during the textile production

[9] 12 Environmental challenges of anthropogenic metals flows and cycles. van der Voet, E., Salminen, R., Eckelman, M., Norgate, T., Mudd, G., Hisschier, R., ... de Koning, A.. Environmental challenges of anthropogenic metals flows and cycles. United Nations Environment Programme. 2013

[10] 13 SHAHZAD AHMAD * et al. ISSN: 2250–3676, INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY Volume-2, Issue-4, 871 – 875, IJESAT, July-Aug 2012

[11] Shane Donatello, Hans Moons and Oliver Wolf (JRC): Revision of EU Ecolabel criteria for furniture products, final technical report, 2017

[12] “Øget videnberedskab om kemiske stoffer i plastindustrien” (Mapping of chemical substances in the Danish Plastics Industry), Working report from the Danish Environmental Protection Agency, No. 5 2008

process[13]. The Swedish Chemicals Agency has identified 2,450 different chemicals that are used during the textile production process. Of these, 1,150 are identified as hazardous and 368 are functional chemicals, such as dyes, hydrophobic finishing and antibacterial finishing chemicals. These chemicals are incorporated into textiles and may therefore pose a possible risk to users and the environment during the use phase.

Fibre production is also associated with significant environmental challenges. Huge amounts of water are required for all cotton farming and conventional cotton production involves high inputs of chemicals. Environmental impacts and carbon footprint are the same for synthetic fibres as for plastics, since they are based on fossil resources and energy is required to produce polymers. Use of recovered and recycled material will reduce the negative environmental impacts of fibre production. Textile wet processes (bleaching, dyeing and finishing) are often a particularly heavy burden on the environment as they involve a high consumption of water, chemicals and often energy.

3.1.2 Production

The environmental impacts during production of the actual furniture are largely linked to emissions of substances that are harmful to health and the environment in connection with processing the materials (e.g. sanding of wood), gluing and surface treatment processes, and production and packaging waste. In the case of wood-based waste, the energy is generally used for heating the production facilities. Textile waste, padding materials and packaging can account for large amounts of waste produced by furniture manufacturers. However, an analysis conducted by Statistics Norway (SSB)[14] of waste from different industries shows that the furniture industry has relatively little waste compared with other industries. Large volumes of the waste are recycled.

3.1.3 Energy and carbon

All stages of the life cycle involve energy, including greenhouse gas emissions. Since the composition of materials in furniture/fitments varies so much, it is also difficult to draw general conclusions. However, it can generally be said, that the primary production of metals, plastic materials, wood-based panels and the production of raw materials for certain types of adhesive are particularly energy-intensive processes. The energy consumed by furniture manufacturers is less than the energy consumed in the production of the constituent materials, and transport also has a smaller impact. In particular, the significance of energy consumption relating to transport and raw materials varies. For furniture with a relatively high content of metals and plastics, the greatest energy consumption relates to the production of the raw materials[15]. Less than 5% relates to transport. The energy intensity of the materials has greater significance than the energy consumed in transport and production. A life cycle assessment of an item of wooden furniture, by comparison, shows that the energy used to transport raw materials and distribute the furniture accounts for approximately 10% of the energy consumed over the life of the furniture.

[13] Advancing life cycle assessment of textile products to include textile chemicals, CHALMERS UNIVERSITY OF TECHNOLOGY 2016
[14] https://www.ssb.no/322374/avfall-fra-industrien.naeringer.1000-tonn
[15] Background document Version 4, Nordic Ecolabelling

There are a number of ways to reduce energy consumption and carbon emissions linked to furniture and fitments. Use of renewable and recycled materials helps reduce energy and carbon footprints. When using renewable raw materials, it is important that they come from sustainable sources. This is important for biological diversity and the climate. Wood raw materials should not be taken from areas that are needed to counter climate change. Recovering and reusing some types of materials, such as aluminium (Al), will greatly help reduce carbon footprints[16]. Conscious choice of design and materials is therefore also a parameter that impacts this.

Focusing on good quality to extend useful life and on design that allows for reuse and replacement of materials will also have a positive impact on energy use and carbon emissions. Obviously, the furniture manufacturer also has opportunities to reduce energy consumption and be environmentally conscious when choosing energy sources and work on reducing transport and improving the efficiency of vehicles in and out of the factory. However, the greatest impact of the finished furniture on energy consumption and carbon emissions is the production of the constituent materials.

3.1.4 Environmental impact during use

The environmental impact of furniture during use is first and foremost an indoor climate problem. A long useful life is also important. See Chapter 1.5 for details. Wooden surfaces, varnishes, glue, textiles, etc. may release various substances, such as formaldehyde and volatile organic compounds that may cause discomfort or harm the health of sensitive individuals. Here too, the choice of materials and input factors will influence the emissions that are produced and the potential problems they create.

3.1.5 Circular economy

Besides production and materials, other aspects also have effects on the environmental impact. From a circular economy perspective, it is important to look at the design of the furniture in relation to the potential for reuse and replacement of parts, sorting the different materials for recycling at end-of-life, as well as quality and useful life. A longer useful life has direct positive effects on the environmental impact and protects society from exposure to adverse environmental conditions related to production of new furniture. Good quality furniture and fitments can be used for many years. Use of chemicals is a factor more indirectly related to the circular economy. For example, it is not appropriate to use or recycle materials that contain substances that are harmful to health or the environment.

3.1.6 What requirements can Nordic Ecolabelling make?

As explained above, Nordic Ecolabelling uses the term Relevance, Potential and Steerability (RPS) to assess what types of products to develop environmental criteria for and what specific requirements to impose. The possibility for Nordic Ecolabelling of imposing requirements for the different parameters that affect the environmental impact of an item of furniture/fitment varies. The potential and steerability for key areas as materials, energy and carbon, chemicals, circular economy are described below.

[16] Prof. Geoff Hammond & Craig Jones, Inventory of Carbon & Energy (ICE), Version 2.0. Sustainable Energy Research Team (SERT). Department of Mechanical Engineering. University of Bath, UK, 2011

Materials

Forestry has a significant bearing on the environmental impacts of wood-based products, and it is important that the renewable raw materials are extracted in a sustainable way in order to reduce the environmental impacts resulting from the cultivation of the raw materials. On this field there is sustainable forestry certification schemes, such as FSC and PEFC with their Chain of Custody systems that Nordic Ecolabelling can lean on. However, it is more difficult to impose requirements for the extraction of raw materials for metal and plastic production, even if this life cycle stage is important to the environmental impact. For example, there are considerable environmental pressures tied to the extraction of bauxite for aluminium production. There are currently no good certification and traceability systems in place for mining. Other ways to reduce the impact of plastics and metals on the environment is to use recycled raw materials and this is where Nordic Ecolabelling can set requirements. Recycled raw materials can also be used in the wood industry to reduce negative environmental impacts.

Chemicals

Nordic Ecolabelling has good experience of setting requirements for chemicals in the production of materials and products. Nordic Ecolabelling generally focuses on restricting the use of chemicals that are harmful to health and the environment as much as possible. Our experience, both in this product group and in other relevant product groups, including floors, construction panels, chemical building products (adhesives, putties, exterior paints and similar products) and interior paints, lacquers and varnishes, shows that Nordic Ecolabelling can set requirements that prohibit and restrict a variety of harmful substances. Nordic Ecolabelling can also set requirements for emissions of substances that are harmful to health. This will mainly be related to the use phase of the furniture. For this, Nordic Ecolabelling can base requirements on standards for measurement of emissions and criteria for emissions.

Energy and carbon

It is difficult to set energy and carbon requirements for the actual production of many of the materials. In order to identify the best production processes, it is necessary to have a comprehensive database of primary data from the specific process, which Nordic Ecolabelling does not have for many materials at this time. This is particularly applicable to production of metal and plastic. Indirectly, energy and climate requirements can be set using recycled material. Nordic Ecolabelling imposes absolute requirements on energy consumption in the production of wood-based panels and paper-based panels, such as HPL. This has been made possible by the availability of data in connection with the development of criteria for construction panels. The criteria place several indirect environmental requirements, such as sustainable extraction of wood raw materials and a ban on the use of tree species which grow in areas that are important for countering climate change. Quality standards that guarantee long life and requirements for e.g. replacement parts are also indirect climate requirements.

Because the amount of energy used in the actual production of the furniture (composition of the product) is small compared with production of the constituent materials, Nordic Ecolabelling has chosen not to set requirements here as there is limited potential for making a difference. Transport also accounts for a small proportion of the energy used related to production of furniture, and it is therefore also less relevant to set requirements for this.

Moreover, Nordic Ecolabelling has extremely limited means of controlling and influencing transport.

Circular economy

Circular economy has been one of the areas of focus in this revision. Good quality is important and can contribute to the long useful life of products. This is where Nordic Ecolabelling can set criteria for compliance with quality standards. In this context, it is important to point out that the term “useful life” is a relative concept. A UK study[17] shows that the typical useful life of office furniture in the UK is 9–12 years, but that the furniture is actually designed and produced for a much longer useful life. Although Nordic Ecolabelling is not able to influence consumer behaviour, it can promote a long lifespan for furniture by ensuring they have a good quality. Furthermore, requirements can be set for other circular processes, e.g. to promote design that allows for recycling and access to replacement parts, offering significant potential to reduce waste and extend the service life of furniture.

Nordic Ecolabelling knows of several projects and enterprises that work with various circular economy business models for the furniture industry. These include for instance renovation of old furniture and leasing of office furniture. In these criteria, Nordic Ecolabelling focuses on the product itself, while circular economy business models are service businesses. They are therefore not covered by these criteria. Under certain conditions, however, it is possible to use reused materials in a Nordic Swan Ecolabelled item of furniture. For example, it is not appropriate to recycle materials that contain substances that are harmful to health or the environment.

3.1.7 UN's Sustainable Development Goals

On an overall level the Nordic Swan Ecolabel contributes to goal 12, “Ensure sustainable consumption and production patterns”. The Nordic Swan Ecolabel strives to reduce the environmental impact of production and consumption. This ensures sustainable production, control of the supply chain and provides end users with sustainable products. Nordic Swan Ecolabelled products are manufactured all over the world. Wherever the Nordic Swan Ecolabelled product is made, the strict environmental requirements for production go beyond legislation. This promotes more environmentally-friendly production methods – in developing countries too.

The criteria for furniture and fitments contribute to goal 12 by setting:

- Requirements for certified, sustainable wood raw materials and traceability, energy requirements for wood-based panels and requirements that stimulate to use of recycled metals and plastics contribute to the sustainable management and efficient use of natural resources.
- Quality testing, user information requirements, warranties as well as availability of spare parts also contribute to optimum utilisation of resources.
- Restrictions on chemicals that are harmful to health and the environment, which are present in the constituent materials and are used in the manufacture of furniture and fitments, reduce the spread of substances of concern and promote the potential of material reuse in the future.

[17] Bartlett, 2009. "Reuse of office furniture – incorporation into the 'Quick Wins' criteria: A study of the market potential for reused and remanufactured office furniture in the UK".

- Restrictions on chemicals that are harmful to health and the environment and requirements for emissions for padding and other relevant materials also contribute to a healthy indoor climate.

Even if Nordic Ecolabelling mainly contributes to goal 12, target 3.9 is also mentioned here. Target 3.9 addresses the reduction of harmful effects caused by chemicals and the reduction of pollution and contamination. Comprehensive and demanding criteria for chemicals, e.g. a ban on chemicals that are classified as harmful to the environment, carcinogenic, mutagenic and toxic for reproduction, requirements for zero emissions from metal coating processes, and other requirements governing emissions from the constituent materials and chemicals, for example VOC emissions from adhesives and in padding materials contribute to this.

4 How to read this criteria document

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

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

- Upload
- Requirement checked on site

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

4.1 Changes compared to previous generation

Figure 1 Overview of changes to criteria for furniture and fitments generation 6 compared with previous generation 5.

Proposed requirement generation 5	Requirement generation 6	Same requirement	Change	New requirement	Comments
O1 Product description and production process	O1	x			
O2 PVC	O2		x		PVC in packaging has been added the requirement
O3 Chemicals during transport	O3	x			
O4–O6 Quality requirements and surface resistance + functional properties mattresses	O4–O6		x		Several standards have been updated, and new test requirements-levels have been added to some furniture types
O7 Marketing			x		Removed from criteria – part of NSE general marketing requirements
O8–O15 Product – circular requirements	O7–O14	x			
O16–O17 Furniture with electric and electronic components	O15–O16				
O18 Packaging			x		Removed from criteria – PVC moved to req. O2
O19–O25 Chemicals	O17–O23	x			
O26–O28 Solid wood, bamboo and cork	O24–O26	x			
O29–O40 Wood based panels	O27–O38	x			
O41–O49 Paper	O39–O47	x			
O50–O61 Laminate	O48–O59	x			
O62–O70 Surface treatment of wood, wood-based panels and laminate	O60–O68	x			
O71–O81 Metal	O69–O79	x			
O82–O98 Plastic, rubber and silicone	O80–O96	x			
O99–O135 Textile	O97–O133	x			
O136–O144 Padding materials	O134–O142	x			
O145–O155 Leather and hide	O143–O153	x			
O156 Mineral raw materials used for sound absorption	O154	x			
O157–O159 Glass	O155–O157	x			
O160 Linoleum	O158	x			

O161–O162 Natural stone and agglomerated stone	O159–O160	x			
O163–O164 Other requirements	O161–O162	x			

5 Requirements and justification of these

This chapter include requirements and background information for the specific requirements.

Definitions

Terms and definitions used in this document.

Abbreviation and terms	Explanation
Adt	Air dry tonne (ADt) is dry solid content of pulp and paper. ADt for pulp is 90%, while ADt for paper means a solid content of 94%.
COD	Chemical oxygen demand. A measurement of the quantity of oxygen that is consumed during the chemical breakdown of organic material.
Domestic furniture	Furniture made for household or personal use.
Furniture ensembles and enclosures	Self-contained, mobile and soundproof.
Ingoing substances in 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 considered as ingoing substances.
Impurities in chemical products	Residuals, pollutants, contaminants etc. from production, incl. production of raw materials that remain in the raw material or in chemical product in concentrations less than 1000 ppm (0,1000% by weight, 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.
Recycled material	Recycled material is defined according to ISO 14021 in the categories of pre-consumer and post-consumer and includes both mechanical and chemical recycling.
Pre-consumer/commercial recycled material	“Pre-consumer" is defined as material that is reclaimed from the waste stream during a manufacturing process. Production waste (scrap, rework, regrind) that can be returned directly to the same process in which it was generated is not counted as recycled pre-consumer material.
Post-consumer/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.

Recovered/recycled fibre	Defined according to ISO 14021. Includes both mechanical and chemical recycling.
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.
Non-domestic furniture	Non-domestic furniture or commercial furniture are furniture intended for use in office buildings, public institutions, hospitals, restaurants, hotels and similar establishments.
Organic	Fibre (such as cotton and wool) that is certified as organic or is in transition to organic in compliance with a standard endorsed by IFOAM Family of Standards, such as Regulation (EU) 2018/848, USDA National Organic Program (NOP), APEDA's National Programme for Organic Production (NPOP), China Organic Standard GB/T19630. The Global Organic Textile Standard (GOTS) and the Demeter Biodynamic Farm Standard are also accepted and are certified as "in transition to organic production". The certification body must have a valid and recognised accreditation for the standard it certifies against, for example, ISO 17065, NOP or IFOAM.

5.1 Description of the product

This chapter contains product specifications such as a description of the product, production methods and any treatment techniques.

O1 Description of the product and production process

Applicants must provide the following information about the product and the production process:

- Product type and market: Specify the type of furniture and its intended market (such as consumer, professional, or not for sale in the open market).
- Description of the product(s) and materials/raw materials included. The total weight of the product and the weight of the constituent materials/raw materials must be stated.
    - No need to specify the types of materials in electrical and electronic components such as electric motors, wires etc.

  - The type of material in small parts does not need to be stated. Small parts include screws, bolts, plugs, brackets, buttons, zips, etc.
  - Small parts do not need to be weighed. The weight calculation does not need to include electrical and electronic components such as electric motor and internal wires etc in e.g., height adjustable desks and beds.
  - Textile is stated as the total weight percentage in the product. More details on the fibre composition in textiles are given in requirement O97 in chapter 5.10.
- Drawing/picture of the product.
- Description, e.g. a flowchart, of the production process*, including materials and which subcontractors perform which stages of the process, e.g. the surface treatment of wood or metal.
- The furniture/fitments must be made of materials for which requirements are imposed in the criteria.
- Materials for which requirements are not imposed must not account for more than 5% by weight. Examples of materials that are not included in the criteria are concrete, ceramic materials and wood-plastic composite (WPC).

** It is not necessary to describe the production process at the individual subcontractor.*

 Detailed description of the points above. An excel sheet can be used to show the different materials and composition. Product data sheets can be sent in as part of the documentation. A flowchart can be used to describe the production process.

Background to requirement O1 Description of the product

The material composition and production processes of an item of furniture provide important information for determining whether the furniture is eligible for the Nordic Swan Ecolabel, the requirements that must be met by the furniture, and who (e.g. subcontractors) must document the requirements.

5.2 Product requirements

Nordic Ecolabelling sets a number of principal requirements for products relating to the materials contained in the furniture/fitment, quality, consumer information and circular economy related requirements, such as warranty.

5.2.1 PVC

O2 PVC

The product and its packaging must not contain* chlorinated polymers/plastics, such as PVC.

** Exception: PVC used in electrical wiring/cables and electronic components such as motors is exempt from the requirement.*

 A declaration from the manufacturer that the product and its packaging does not contain PVC.

Background to requirement O2 PVC

A ban on PVC in both products and packaging is a requirement that Nordic Ecolabelling includes in many criteria. The environmental impact of PVC is associated primarily with waste management, the use of additives and dioxin emissions, for example in the manufacture and incineration of PVC. The latest membrane cell technology is considered to be the most environmentally-sound means of production, but the membranes are coated with PFAS and this represents a potential source of PFAS contamination to the environment[18],[19]. The mercury method is still used to produce chlorine at some production facilities.

Plasticisers that have adverse health and environmental effects, such as phthalates, are frequently added to PVC. So-called imitation leather can be coated with plasticised PVC[20]. Some consultative bodies have commented that PVC is necessary for furniture for the health sector. However, there are other consultative bodies that have pointed out that there are alternatives to PVC for furniture for the health sector, such as PU. The ban on PVC is in line with requirements in other type 1 ecolabels such as EU Ecolabel and Blauer Engel in Germany. For more information on Nordic Ecolabelling's view on PVC, see www.nordic-swan-ecolabelling.org[21].

5.2.2 Biocides during transport

O3 Biocides during transport

Biocides in the form of pure active substances or as biocide products may not be used during transport of the finished furniture.

- A declaration from the furniture manufacturer confirming that no biocides have been used during transport.

Background to requirement O3 Biocides during transport

Biocides can be used during transport of the furniture. However, substances that are added during transport were not included in this requirement. It has therefore been removed from the chemical requirements and added as a separate requirement. Dimethyl fumarate (DMF) is a mould and fungus killing agent which was found a few years ago in upholstered furniture, such as sofas and armchairs imported from China[22]. The agent was used during transport of the furniture and was not directly added to the products. The agent can cause serious allergic reactions. It is not approved for use as a biocide in the EU/EEA.

[18] Chlorine and Building Materials: A Global Inventory of Production Technologies, Markets, and Pollution, Phase 1: Africa, The Americas, and Europe
[19] Chlorine and Building Materials: A Global Inventory of Production Technologies, Markets, and Pollution, Phase 2: Asia, Healthy Building Network, 2019
[20] The Danish Environmental Protection Agency, Green Tips for Furniture: https://mst.dk/kemi/kemikalier/saerligt-for-borgere-om-kemikalier/groenne-tips/hjemmet/moebler-uden-pvc-og-phthalater/ (downloaded 10 October 2019)
[21] https://www.nordic-swan-ecolabel.org/nordic-ecolabelling/environmental-aspects/circular-economy-and-resource-efficiency/pvc/
[22] https://www.news-medical.net/health/Dimethyl-Fumarate-Allergy.aspx

5.2.3 Quality

O4 Performance properties

This requirement applies to the furniture types and fittings listed in the table below.

The product must be tested for strength, stability and safety and meet the requirements of the relevant standard(s) and follow the standards for testing stated in the table below. Mattresses must also meet requirement O6. Other relevant standards maybe accepted if the testing institute provides documentation proving that alternative test is equivalent and produces comparable results.

In cases where the products are aimed at both domestic and non-domestic environment, the requirements for non-domestic environment apply.

Testing must be performed by an independent, accredited testing institute. Internal test laboratories can be approved under certain conditions, see Appendix 1.

The testing shall be carried out in accordance with the applicable version of the standard. If a standard is revised during the period of validity of the license, the licensee is responsible for ensuring compliance with the updated requirements.

End-use environment	Type of furniture	standards
Domestic environment	Seating	EN 12520 Furniture – Strength, durability and safety – Requirements for domestic seating EN 1022 Furniture – Seating – Determination of stability EN 1728 Furniture – Seating – Test methods for the determination of strength and durability
	Tables	EN 12521 Furniture – Strength, durability and safety – Requirements for domestic tables EN 1730 Furniture – Tables – Test methods for the determination of stability, strength and durability EN 14072 Glass in furniture – Test methods
	Storage furniture, kitchen, bathroom, fittings and worktops	EN 14749 Furniture – Domestic and kitchen storage units and kitchen worktops – Safety requirements and test methods EN 16122 Domestic and non-domestic storage furniture – Test methods for the determination of strength, durability and stability EN 14072 Glass in furniture – Test methods
		OR EN 16121:2023, Level 1 – Non-domestic storage furniture – Requirements for safety, strength, durability and stability EN 14072 Glass in furniture – Test methods
	Kitchen drawers and doors	EN 16121:2023, Level 1 – Non-domestic storage furniture – Requirements for safety, strength, durability and stability EN 14072 Glass in furniture – Test methods
	Furniture for sleeping and mattresses	EN 1725 Domestic furniture – Beds and mattresses – Safety requirements and test methods EN 1957 Furniture – Beds and mattresses – Test methods for the determination of functional characteristics and assessment criteria EN 1022 Furniture – Seating – Determination of stability
	Bunk beds/high beds	EN 747–1 Furniture – Bunk beds for domestic use – Part 1: Safety, strength and durability requirements

		EN 747–2 Furniture – Bunk beds for domestic use – Part 2: Test methods
	Children's highchairs* (ages 6–36 months)	EN 14988 Children's highchairs – Requirements and test methods. Part 1: safety requirements
	Shower enclosures/shower walls*	EN 14428 Shower enclosures – Functional requirements and test methods
	Seating for children*	EN 17191 – Seating for children – Safety requirements and test methods
Non-domestic	Seating	EN 16139:2013 Level 1 – Furniture – Strength, durability and safety – Requirements for non-domestic seating EN 1728 Furniture – Seating – Test methods for the determination of strength and durability EN 1022 Furniture – Seating – Determination of stability ~~EN 1335-1 Office furniture - Office work chair - Part 1: Dimensions - Determination of dimensions~~ ~~EN 1335-2 Office furniture - Office work chair - Part 2: Safety requirements~~
	Tables	EN 15372:2023 Level 2 – Furniture – Strength, durability and safety – Requirements for non-domestic tables EN 1730 Furniture – Tables – Test methods for the determination of stability, strength and durability EN 14072 Glass in furniture – Test methods
	Storage furniture	EN 16121:2024 Level 1 – Non-domestic storage furniture – Requirements for safety, strength, durability and stability
	Kitchen, bathroom, fittings and worktops	EN 14749 Furniture – Domestic and kitchen storage units and kitchen worktops – Safety requirements and test methods EN 16122 Domestic and non-domestic storage furniture – Test methods for the determination of strength, durability and stability EN 14072 Glass in furniture – Test methods
		OR EN 16121:2023: Level 1 – Non-domestic storage furniture – Requirements for safety, strength, durability and stability EN 14072 Glass in furniture – Test methods
	Kitchen drawers and doors	EN 16121:2023, Level 1 – Non-domestic storage furniture – Requirements for safety, strength, durability and stability
	Furniture for sleeping and mattresses	EN 1725 Domestic furniture – Beds and mattresses – Safety requirements and test methods EN 1957 Furniture – Beds and mattresses – Test methods for the determination of functional characteristics and assessment criteria EN 1022 Furniture – Seating – Determination of stability
	Bunk beds/high beds	EN 747–1 Furniture – Bunk beds for domestic use – Part 1: Safety, strength, and durability requirements EN 747–2 Furniture – Bunk beds for domestic use – Part 2: Test methods
	Furniture ensembles and enclosures	EN 16121 Non-domestic storage furniture. Requirements for safety, strength, durability and stability ISO 23351–1 Acoustics — Measurement of speech level reduction of furniture ensembles and enclosures – Part 1: Laboratory method

Schools/institutions	Chairs and tables for educational institutions	EN 1729–1 Furniture – Chairs and tables for educational institutions – Part 1: Functional dimensions EN 1729–2 Furniture – Chairs and tables for educational institutions – Part 2: Safety requirements and test methods
	Storage furniture	~~Must meet standards for non-domestic use:~~ EN 16121:2023 Level 1 – Non-domestic storage furniture – Requirements for safety, strength, durability and stability
	Whiteboards, blackboards	EN 14434:2023, Level 2 – Writing boards for educational institutions – Ergonomic, technical and safety requirements and their test methods
Offices	Work chairs	EN 1335–1 Office furniture – Office work chair – Part 1: Dimensions – Determination of dimensions EN 1335–2 Office furniture – Office work chair – Part 2: Safety requirements EN 12529 Castors and wheels – Castors for furniture – Castors for swivel chairs – Requirements
	Work tables ~~(sitting)~~	EN 527–1 Office furniture – Work tables and desks – Part 1: Dimensions EN 527–2 Office furniture – Work tables – Part 2: Safety, strength, and durability requirements
	~~Work tables (standing)~~	~~EN 527-2 Office furniture - Work tables - Part 2: Safety, strength, and durability requirements~~
	Storage furniture	~~EN 14073-2 Office furniture - Cabinets and shelves - Part 2: Safety requirements~~ ~~EN 14073-3 Office furniture - Cabinets and shelves - Part 3: Test methods for the determination of stability and strength of the structure~~ ~~EN 14074 Office furniture - Tables and desks and storage furniture - Test methods for the determination of strength and durability of moving parts~~ EN 16121:2023 Level 1 – Non-domestic storage furniture – Requirements for safety, strength, durability and stability
	Screens	EN 1023–1 Office furniture – Screens – Dimensions EN 1023–2 Office furniture – Screens – Part 2: Mechanical safety requirements
	Sound absorption	EN ISO 354 Acoustics – Measurement of sound absorption in a reverberation room ISO 20189 Acoustics — Screens, furniture and single objects intended for interior use — Rating of sound absorption and sound reduction of elements based on laboratory measurements EN ISO 11654 Acoustics – Sound absorbers for use in buildings – Rating of sound absorption
	Table screens	Work table partitions EN 1023–2 Screens – Part 2: Mechanical safety requirements
	Writing boards	EN 14434:2023, Level 2 Writing boards for educational institutions – Ergonomic, technical and safety requirements and their test methods

**The requirements apply irrespective of whether the products are for domestic or non-domestic use.*

- Information stating what purpose and intended end use the furniture has been tested for. The relevant standard and test institute must be stated.
- Test report showing compliance with the requirement.

- If relevant, include a statement on how other standards compared to EN or ISO requirement levels.

Background to requirement O4 performance properties

In generation 6 of the criteria the requirement has been updated according to the newest standards. New minimum performance levels (level 1 or 2) have been introduced for test of various types of furniture. Also, it has been clarified that mobile, self-contained and soundproof furniture ensembles and enclosures is part of the criteria. The requirement and requirement level for performance properties are at the same level as Swedish Möbelfakta[23]. Swedish Möbelfakta is an ecolabel for furniture owned by IVL Swedish Environmental Institute and The Swedish Federation of Wood and Furniture Industry (TMF) operating on the Swedish market. It is important that a Nordic Swan Ecolabelled product is of good quality and is safe to use. This is to contribute to a longer service life for the furniture. In those cases where a product consists of small variations and / or compositions, e.g. different sizes, then the testing can be done on the variant of the furniture which is the "worst case" – it is therefore not necessary to test each individual variant. If this is the case, a description must be submitted to Nordic Ecolabelling which shows how the "worst case" consideration has been made.

O5 Wear resistance of surfaces

Surfaces that are varnished, painted, or have a foil, melamine or laminate finish must meet the requirements for wear resistance stated in the tables below.

The requirements do not apply to:

– interior doors

– untreated surfaces

– surfaces treated with soap, wax, or oil,

– surfaces covered with linoleum.

The testing shall be carried out in accordance with the applicable version of the standard. If a standard is revised and updated during the period of validity of the license, the licensee is responsible for ensuring compliance with the updated requirements.

Use class	Furniture surface		Requirements
Domestic	Seating furniture Tables Reclining furniture Storage furniture	Undercarriage – legs and frames Undercarriage – legs and frames Undercarriage – legs and frame interior Surfaces incl. drawer bottoms	Req. Category 1
	Seating furniture Reclining furniture Storage furniture	Seats, backrests and arm rests Other surfaces excl. bases External surfaces	Reg. category 2
	Tables	Tables tops	Req. category 4
Non-domestic/ offices	Seating furniture Tables Reclining furniture Storage furniture	Undercarriage – legs and frames Undercarriage – legs and frames Undercarriage – legs and frame interior Surfaces incl. drawer bottoms	Req. Category 1

[23] https://www.mobelfakta.se/Vara-krav.html (visited March 2025)

	Seating furniture Reclining furniture Storage furniture	Seats, backrests and arm rests Other surfaces excl. undercarriages External surfaces	Req. Category 2
	Table tops	For table tops such as conference, waiting room and library. Refers to the top. For e.g. restaurant, café and training halls see below	Req. Category 4
	Table tops	Designed for restaurants, café, study environments, etc. Refers to the top.	Req. Category 5
Kitchen and bathroom fittings		Interior surfaces and drawer bottoms, excluding shelves and bottoms	Req. Category 1
		Exterior surfaces, shelves and bottoms	Req. Category 3
	Worktop		Req. Category 6

Requirement category			**Requirement levels**					
Test		**Test method**	**1**	**2**	**3**	**4**	**5**	**6**
Water	1)	EN 12720:	6 h[a]	16 h	16 h	24 h	24 h	24 h
Grease	1)	EN 12720:	24 h[b)]	24 h	24 h	24 h	24 h	24 h
Grease + scratches	1)	SS 83 91 22	-	-	-	24 h + 3 N	24 h + 5 N	24 h + 5 N
Scratches	2)	SS 83 91 17	-	3 N	3 N	3 N	5 N	5 N
	3)	or EN 15186, method A	-	1.5 N	1.5 N	1.5 N	3 N	3 N
Alcohol	1)	EN 12720:	-	-	-	1 h	1 h	1 h
Coffee	1)	EN 12720:	-	1 h[c)]	1 h	1 h	1 h	1 h
Heat, dryness	1)	EN 12722:	-	-	-	70°C	70°C	180°C
Heat, moisture	1)	EN 12721	-	-	-	-	-	85°C
~~Heat on edge~~	~~1)~~	~~NS 8061~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~85°C~~
Water on edge	1)	SS 83 91 20	-	-	6~~1~~ h[d)]	-	-	1 h
Sweat, acid and alkaline	1)	EN 12720	-	1 h[e)]	-	-	-	-
Impact on surface and edge	1)	SS 83 91 23	-	-	25mm[d)]	-	-	25mm
Steam on edge (doors)	1)	SS 83 91 25	-	-	55° (±5)[d)]	-	-	-
Steam on edge (worktop)	1)	SS 83 91 24	-	-	-	-	-	55° (±5)

1) = A result of at least 4 is a pass score in the assessment.

2) = Maximum scratch width 0.5 mm. Penetration of the varnish layer is not acceptable.
3) = Maximum scratch width 0.3 mm

For laminates, requirements and tests in accordance with SS-EN 438-2, -3 are also accepted. It must then include clauses 10, 16, 20, 25 and 26 with the same liquids according to the table above and humid heat according to SS-EN 12721: 2009. For requirements category 1–5, level VGS is accepted. For requirement category 6 level HGS is required as well as testing of edge on finished panel.

For melamine coated panels, requirements and testing according to SS-EN 14322: 2017 with liquids as specified in the table above are also accepted.

~~** = Applies to storage units – external horizontal surfaces*~~
~~***= Applies to doors and drawer fronts on kitchen and bathroom fitments*~~
~~**** = Applies to armrests on seating.*~~

a) For the inside back of kitchen fittings, 1 hour applies.

b) For the inside back of the kitchen fittings, Grease 24 h

c) Applies to storage furniture – external horizontal surfaces

d) Applies to doors and drawer pieces in kitchens and bathrooms

e) Applies to arm rest

Requirements and requirement levels are based on Swedish Möbelfakta's requirements specification 2024–07–01.

Shower walls / Partitions

Shower walls / partitions refer to products that are set up between showers and / or toilets / urinals / changing compartments in public premises such as changing rooms in swimming pools and schools. The product must be tested according to the relevant standard in the EN 438-series and meet the requirement level given for VGS (laminate grade). Level 5 (no visible change or equivalent wording) must be met for the parameters where this is specified. Products that consist of plastic or glass must meet relevant requirements in EN 14428, see O4.

T̄ Test report showing that relevant requirement levels have been met. The test report must specify the method/standard used, the laboratory, and confirm that the analysis laboratory is an independent third party. Alternative test methods may be accepted if an independent third party verifies their correlation to the stated methods.

Background to requirement O5 wear resistance of surfaces

The intent of the requirement is to ensure that surfaces that are varnished or have a foil, melamine or laminate finish are of a high quality and have good wear resistance. Furniture with marks or scratches might otherwise be discarded before it is worn out.

IN generation 6 of the criteria the requirement has been changed compared to generation 5 of the criteria. 3 new requirement categories and corresponding requirement levels have been introduced to the requirement: impact on surface and edge, steam on edge (door) and steam on edge (worktop). The requirement and requirement level for performance properties correspond to Swedish Möbelfakta[24].

O6 Functional properties – mattresses

Mattresses, including mattress covers, must be tested according to EN 1957 and meet the following functional properties:

- Loss of height < 15%
- Loss of firmness < 20%

[24] https://www.mobelfakta.se/Vara-krav.html (visited March 2025)

Decrease in height and firmness refers to the difference between the initial measurements (after 100 cycles) and the measurements performed after the durability test has been completed (after 30,000 cycles).

- Test report confirming compliance with the required levels. The report must specify the method/standard used, the testing laboratory, and confirm that the laboratory is an independent third party. Alternative test methods may be accepted if an independent third party verifies their correlation to the stated methods.

Background to requirement O6 functional properties – mattresses

The requirement for testing according to EN 1957 also existed in previous criteria generation. It has now been supplemented with requirement levels that are harmonized with EU Ecolabel's requirements for mattresses. It is important that a Nordic Swan Ecolabelled mattress has good functional properties and retains its firmness and thickness over time.

5.2.4 Circular requirements

In this chapter, several of the requirements related to circular economy are gathered. However, it is pointed out that there are also several other requirements that are related to this topic, including requirements for the proportion of recycled plastic and requirements for chemicals that reduce the use of harmful substances that thus disappear from the recycling loop.

O7 Warranty and spare parts

Warranty

- Beds and mattresses: Minimum warranty period of 10 years for frame and spring breakage. The entire product must have a 5–year warranty.
- Kitchen: Minimum warranty of at least 10 years.
- Other products: Minimum warranty of at least 5 years.

By warranty is meant an agreement between buyer and seller that goes beyond the legal warranty and where the seller/manufacturer must offer to repair or replace parts that are damaged or not working properly. The warranty shall apply from the delivery date and must be communicated to the customer. The warranty must be included in the product price.

Spare parts

- Essential spare parts e.g., hinges, gas lift, adjustment functions, wheels etc. must be available for at least 10 years after the product is discontinued.
- Manufacturers must retain design specifications to allow reproduction of parts when needed.
- If an identical replacement part is unavailable, an alternative that maintains functionality must be provided.

- Description of the warranty terms, coverage, and how they are communicated to the customer.

- List of essential spare parts, product's function, which spare parts are offered and how this is communicated to the customer.

Background to requirement O7 Warranty and spare parts

A Nordic Swan Ecolabelled product must have a good quality, and together with requirements related to quality, warranty is a factor that signals the product's lifetime and says something about what the customer can expect from the product. However, warranty should not be equated with longevity alone, which is affected by many factors, including how hard and often the product is used. A warranty is something that goes beyond the legal warranty and is an agreement between buyer and seller. The legal warranty is regulated by law in contrast to a warranty. A warranty can be designed in many ways, but Nordic Ecolabelling has set as a minimum requirement that it must go beyond the legal warranty and that it must include replacement/repair if something breaks or does not work properly. The warranty times are based on surveys of what is provided by warranties in the market, consultation comments and regulation of the legal warranty in Europe and the Nordic countries. The legal warranty in the EU is a minimum of 2 years. Some countries, such as Norway, have a legal warranty for 5 years. It is important to emphasize that the warranty must cover more than what is covered by the legal warranty.

Lack of spare parts is highlighted as a hinder to more circularity in the furniture industry[25]. The Nordic Swan Ecolabel can help to influence this in a positive direction by making spare parts available or being able to produce them when needed for at least 10 years after the product has been discontinued.

Requirements for warranty and spare parts can stimulate manufacturers to make good quality products and choose suppliers who also supply high quality materials and parts. This is important for the product to have a long lifetime.

O8 Traceability labelling

The furniture/fitment must be labelled with the manufacturer's or retailer name. Electronic marking, such as QR code is also accepted.

- ⭱ Picture or description of how the labelling applied.

Background to requirement O8 Traceability labelling

Labelling the product with the manufacturer's or retailer's name makes it easier for the user to know who to contact for any questions about the product, maintenance, spare parts, etc. It also ensures better traceability if the product changes owner.

O9 Disassembly and separability

The following information must accompany the product and be available for download on the manufacturer's or retailer's website for at least 10 years after the product is discontinued.

- Sketch/illustration showing replaceable parts and required tools.
- Step-by-step instructions on how to replace parts and components.

- ⭱ Sketch/illustration, instructions and a description of how this information is communicated to the customer.

[25] Circular Economy opportunities in the furniture sector, 2017, report from European Environmental Bureau.

Background to requirement O9 disassembly and separability

Information on disassembly and instructions for this is important in the event of any repair / replacement of parts. If it can be ensured electronically that the information is available for a minimum of 10 years, e.g., by marking with a QR code, this can be approved.

O10 Metal – disassembly

The furniture must be designed so that parts of metal can be separated from other materials. parts of the furniture, e.g., a metal base must be detachable from a wooden tabletop, or metal legs on a sofa must be removable from a sofa frame.

Metal must not be a constituent material in composite materials, e.g., metal reinforcement is prohibited. Foams moulded onto metal is also prohibited.

- Description of how metal can be separated from other materials.

Background to requirement O10 Metal – disassembly

Metal can be used as reinforcement in other types of material, which can destroy the possibility of recycling and can also destroy recycling equipment, e.g., when cutting a plate. It is important to recycle metal as primary production of metal has major climate and environmental impacts.

O11 Maintenance

Instructions for cleaning and maintenance of the furniture/fitment with specific instructions for the different materials must accompany the product. These instructions must be available for download for at least 10 years on the manufacturer's or retailer's website after the product is discontinued. Alternatively, a QR-code or link to the website and the information can accompany the product.

- Instructions for cleaning and maintenance as well as how this is communicated to the customer.

Background to requirement O11 maintenance

Proper maintenance is important for a long product life span. If it can be ensured electronically that the information is available for a minimum of 10 years, e.g., by marking with a QR code, this can be approved.

O12 Consumer information

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

- An illustrated assembly instruction if the furniture or fitment has a mountable construction.
- If the manufacturer has a take-back system for the product, this must be informed.
- Information about which materials the product consists of.
- Specify the standards by which the product is tested.

Alternatively, a QR-code or link to the website and the information can accompany the product.

- Product information intended for customers.

Background to requirement O12 consumer information

The requirement contains important consumer information such as assembly instructions and possible take-back of the product. Which materials the product is made of is relevant information when the product is to be discarded/recycled to make it easier to sort the materials into the correct fractions.

O13 Removable covers

Removable covers for furniture (e.g., sofa cushions, seat, back and headrest) or mattresses must be labelled with material type and washing instructions.

- Description / picture of labelling and washing instructions.

Background to requirement O13 removeable covers

It is important that the consumer receives correct information about treatment in order to extend the product life span. Proper treatment helps to maintain quality and the cover can still be used after washing.

O14 Circular design

To support circular design, the following requirements apply to different category of furniture/fitments. Countertops, partitions between showers/toilets and accessories to continental beds such as headboards are exempt from the requirement.

Upholstered furniture

For upholstered furniture, the requirement can be documented by fulfilling point A) or B) below:

A) The whole product has a circular design where main parts and different materials (such as wood, wood-based boards, plastic, metal, padding and textile) can be separated, replaced, and repaired/renovated. By main parts is meant e.g. seat, back, legs/chassis/base and cushions. The outer textile covers on e.g. the seat or back, must be possible to separate from the padding material.

The requirement does not cover the constituent components within a material, e.g. wood fibre and glue in a wood-based panel, different padding materials glued together or different types of fibre in the textile.

B) At least two of the following points must be met:

- The product consists of a minimum 70% by weight of recycled* and/or renewable** materials.
- The fabric must be removable for washing or replacement (not glued or permanently attached for example by stitching).
- The cushions must be replaceable e.g. using velcro.

- Upholstered parts, e.g. the seat/back of a chair, must be possible to dismantle and replace.
- Manufacturer offers a takeback system for upgrades, repairs or renovation.

Continental beds and frame beds/mattresses

At least two of the following points must be met:

- The textile cover of the bed and/or top mattress can be removed for washing or replacement, e.g. no glue, staples or stitching is used.
- At least 70% by weight must be of recycled* and/or renewable** materials (excluding padding).
- Replaceable mattress cassette(s) in continental beds.
- Made of pure materials for easier recycling. By pure materials is meant e.g. metal, solid wood, and plastic and not composite materials is not regarded as pure material.
- Padding material in the individual mattress must be of one type, e.g. either 100% latex or 100% polyurethane foam or the padding materials can be different if the materials are not glued together. Padding material of the same type can be glued (e.g. polyurethane foam can be glued together with polyurethane foam).
- Textiles (all textile parts on the bed / mattress except for textiles around pocket springs and textiles that are exempted in O97 Material restrictions) shall either:
    - Contain only one type of fibre e.g. 100% wool, 100% polyester or
    - be a mixture of cellulose-based material, e.g. a blend of viscose and cotton.
- Manufacturer offers to take-back system the bed for upgrades, repairs, or renovation.

Mattresses (sold separately)

At least one of the following points must be met:

- Fabric must be removable for washing or changing, (not glued or stitched to the padding material) has been used to attach the fabric to the padding material or the fabric is not stitched to the padding material, so it can be easily removed for washing or changing.
- Padding material must be of one type, e.g. either 100% latex or 100% polyurethane foam or the padding material can be different as long as the materials are not glued together. Padding material of the same type can be glued (e.g. polyurethane foam can be glued together with polyurethane foam).
- Textiles must either
    - consist of only one type of fibre, e.g., 100% wool or 100% polyester or
    - be a mixture of cellulose-based material, e.g., a blend of viscose and cotton.

Other Furniture and Fitments

At least two of the following points must be met:

- Circular design: Main parts/materials must be separable, replaceable, repairable, or upgradable.

By main parts is meant e.g. seat, back, legs/chassis/base, tabletop and fronts on cabinets/drawers. The requirement does not cover the constituent components within a material, e.g. wood fibre and glue in wood-based panels, as well as laminate and linoleum that are glued to a carrier.

- At least 70% by weight must be of recycled * and / or renewable materials**.
- Made of pure recyclable materials. By pure materials is meant e.g. metal, solid wood, paper and plastic. Composite materials such as fibreglass-reinforced plastic is not considered as pure material.
- No glue is used in the composition of the various materials (except glue that is part of a wood-based panel)
- Manufacturer offers a takeback system for upgrade, repair or renovation.

** Recycled is defined according to ISO 14021 in the category's pre-consumer and post-consumer. See Definitions.*

*** Wood-based panels are considered renewable even if they contain glue.*

 Description showing which points are met.

Background to requirement O14 circular design

There are several ways to promote circularity. It can be related to the constituent materials, such as the use of renewable/recycled materials and the use of materials that can be easily recycled or to design the product so that parts can be replaced, the product can be more easily repaired or renovated. As there are a number of different furniture types and fitments that can be Nordic Swan Ecolabelled and there are different prerequisites depending on the type of furniture, different categories have been made; Upholstered furniture, continental beds/frame beds, mattresses and other furniture/fitments.

For textiles, it is specified that the textile must consist of one type of fibre or of cellulose-based fibres. For cellulose-based fibres, a mixture is permitted as technology is now available to use this in new production of regenerated cellulose. There are constant developments in the field of textile recycling, but at present it is difficult to distinguish different types of fibre that are mixed in a textile product. Therefore, only one type of fibre is required. For padding materials, recycling (post-consumer) is uncommon, but here too there may be new opportunities in the future with the great focus on circularity in society. At present, it is considered that the most important thing is that padding materials such as latex and PUR foam can be sorted into pure fractions and therefore glue is only allowed if the same type of foam is glued together.

5.2.5 Furniture with electrical and electrical components

The requirement in this chapter concerns lamps/light sources that are part of a furniture and requirements for energy consumption in stand-by mode.

Please note that electrical and electronic components such as motors, controls and control boxes are exempt from the general chemical requirements and the relevant material requirements (plastic and metal). However, please note that furniture with electronics must comply with several laws related to these components. Examples of relevant legislation are the RoHS directive, the WEEE directive, the REACH regulation and the ECO design directive (if external power supply is used). Relevant legislation must be complied with for all

Nordic Swan Ecolabelled products and the applicant states that all relevant laws and regulations have been complied with when signing the application form.

Lamp as a furniture feature

The requirement applies to lamps which is built-in or recessed into the furniture, e.g. in a cupboard or in a drawer. Free-standing lamps cannot be labelled.

O15 Lamps / light sources

Lamps / light sources can be a part of a furniture/fitment, e.g. in a cabinet or drawer. If lamps are included, the following must be met:

- The light source must be LED.
- The light source must be replaceable.

- Description of where the lamp is included in the product.
- Declaration from the manufacturer confirming use of LED light sources and their replaceability

Background to requirement O15 lamps/light sources

The requirement concerning the use of LED light sources is to ensure that any lamps that are built-in or recessed into furniture use minimal energy. They also have a long useful life. The ability to change the light source also extends the useful life of the furniture/fitment.

O16 Standby energy consumption

Furniture with electric and electronic components (e.g., height adjustable tables and adjustable beds) must meet the following requirements:

- Maximum standby energy consumption: 0.3 W.
- If the furniture has a network function, the network standby energy consumption must not exceed 2 W.

Testing must follow method EN 50564 or equivalent standard.

- Test report according to EN 50564 showing that the requirement is fulfilled.

Background to requirement O17 standby energy consumption

Furniture with electric and electronic components such as height adjustable tables and adjustable beds are often in standby mode around the clock. Therefore, a requirement for a maximum standby consumption of 0.3 W is set to ensure a low energy consumption. The European Commission has prepared a proposal for a revised Ecodesign Directive, where standby is set at 0.3 W and network standby for furniture that has a network function is set at 2 W. Standby consumption is also something that public procurement have on the agenda[26].

[26] https://sparenergi.dk/offentlig-og-erhverv/indkoeb-og-adfaerd/indkoebsanbefalinger/haeve-saenke-borde (tilgjengelig 31.01.2020)

5.3 Chemicals

Nordic Ecolabelling sets requirements for chemicals that are used during the manufacture of the constituent materials, for the manufacture/assembly of the furniture and for surface treatment. The chemical requirements include products such as glue, varnish, staining, primer, filler, oil, soap, joint filler, sealants, colour products, binders, pigments, bleaching chemicals and the like.

Auxiliary substances such as lubricating oil and cleaning detergents are not covered by the requirements.

The chemical requirements do not apply to wires, electric or electronic components such as motors. However, it is important to notice that relevant regulatory requirements, such as the RoHS directive, must always be met. The chemical requirements also do not apply to chemicals used in the production of steel or aluminium or alloys that are included.

The requirements for chemicals are not all found in one chapter but will be specified in the chapter for each individual material, e.g. chemicals that are relevant in the manufacture of wood-based panels will be specified in the chapter for wood-based panels and chemicals used in the production of laminates will be specified in the chapter on laminates. An exception to this is the requirements to surface treatment of wood, wood-based panels and laminate, which are placed together in one chapter.

Much of the production process takes place at the subcontractors these days, but the furniture manufacturers often do some stages of the process, such as assembling the finished piece of furniture, themselves. There are some furniture manufacturers that do more of the production themselves. The criteria for chemicals must be met regardless of whether the chemicals are used at the subcontractors' or the furniture manufacturers' facilities. The chapters that apply to subcontractors/producer of different materials and to the furniture manufacturer or the subcontractor that assembles/produces the finished piece of furniture are given below.

Type of chemical/material	**Chapter**
Chemicals used by the furniture manufacturer in its production/assembly of the furniture/fitment (does not apply to chemicals for surface treatment. Chemicals used for surface treatment of wood, wood-based boards and laminate are specified in chapter 5.7.3 or in the respective chapter for the relevant material).	5.3.1
Chemicals used by subcontractors that produce/assemble the finished piece of furniture/fitment (does not apply to chemicals for surface treatment. Chemicals used for surface treatment of wood, wood-based boards and laminate are specified in chapter 5.7.3 or in the respective chapter for the relevant material).	5.3.1
Chemicals for wood-based panels	5.5
Chemicals for paper	5.6
Chemicals for laminate	5.7
Chemicals for surface treatment of wood, wood-based panels and laminate	5.7.3
Chemicals for metallisation and other surface treatment of metal *The chemical requirements do not apply to chemicals used in the production of steel or aluminium or alloys that are included.*	5.8
Chemicals for plastics, rubber and silicone	5.9
Chemicals for textiles	5.10

Chemicals for padding materials	5.12
Chemicals for hide and leather	5.13

Definitions

The following definitions apply to all the requirements for chemicals unless otherwise stated. The requirements apply to all ingoing substances in the chemical product, but not to impurities unless otherwise stated in the specific requirement. Ingoing substances and impurities are defined below.

Ingoing substances: All substances in the chemical product, including additives (e.g. preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g. formaldehyde, arylamine, in-situ generated preservatives) are also considered as ingoing substances.

Impurities: Residuals, pollutants, contaminants etc. from production, incl. production of raw materials that remain in the raw material or in chemical product in concentrations less than 1000 ppm (0,1000% by weight, 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.

5.3.1 Chemicals used by furniture manufacturers and subcontractors

The requirements in this chapter apply to chemicals that are added to the furniture/fitment or are used in the production/assembly of the furniture/fitment at the production site of the furniture/fitment or at the subcontractor's facility. A subcontractor can assemble parts of or the entire piece of furniture. Any chemicals used here, e.g. adhesives, must meet the requirements stated in this chapter.

If the furniture/fitment manufacturer itself performs much of the production process, and/or adds chemicals or carries out some of the chemical treatment, e.g. coating, the criteria for chemicals in the respective chapter for the relevant material must be met. It is emphasized that the requirements in this chapter do not apply to the production of various materials such as wood-based panels, metal, or textiles. These are stated in separate chapters, see introductory text in chapter 3.5 Chemicals.

O17 Antibacterial substances

Chemical products and nanomaterials* with antibacterial or disinfectant properties must not be added to the finished item of furniture or fitment.

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

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

t̄ A declaration from the manufacturer of the furniture/fitment or the subcontractor stating that no chemical products and nanomaterial with antibacterial or disinfectant properties have been used on the surface of the finished furniture/fitment.

Background to requirement O17 antibacterial substances

Based on the precautionary principle, Nordic Ecolabelling wants to adopt a restrictive stance on the use of nanoparticles.

Products treated with antibacterial substances are often marketed as preventing bacteria formation, growth, and odours. Antibacterial finishing is usually not needed and must be used with caution, since they may be hazardous to human health and the environment. Also, increased use of biocides can lead to bacteria becoming resistant to antibiotics.

O18 Classification of chemical products

Chemical products must not have any of the classifications in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372

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

Note that responsibility for correct classification lies with the manufacturer.

Exemptions apply to:

- The classification H351 for adhesive containing methylene diphenyl diisocyanate (MDI)
- The classification H350 and H341 for adhesives containing formaldehyde (CAS No. 50–00–0) provided the requirement for free formaldehyde (O23), is fulfilled.

T̄ A declaration from the chemical manufacturer or supplier.

T̄ A safety data sheet for the product in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

Background to requirement O18 classification of chemical product

The requirement concerning the classification of chemical products used during the manufacture of furniture/fitments has not been changed. This is a classification that did not exist when the criteria were previously revised. Nordic Ecolabelling is generally committed to restricting the use of chemicals that are harmful to health and the environment, and the classification requirement prohibits the products of highest concern.

Exemptions apply to adhesives classified with H351 due to isocyanates and adhesives classified with H350 and H341 due to formaldehyde. The furniture manufacturers use adhesives for different purposes. This also means that they use different types of adhesives and two-component adhesives can contain isocyanates and formaldehyde. The exception for adhesives containing formaldehyde is granted only if later requirements for free formaldehyde are met. An adhesive that has a low content of free formaldehyde is both better in terms of working environment and has a lower emission from the finished furniture.

O19 Classification of ingoing substances

Ingoing substances (see Definitions) in the chemical product must not have any of the classifications in the table below:

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemptions apply to:

- The classification H351 for adhesive containing methylene diphenyl diisocyanate (MDI).
- The classification H350 and H341 for adhesives containing formaldehyde (CAS No. 50–00–0), if the requirement to free formaldehyde, which is regulated in a separate requirement, is fulfilled.
- The classification H351 for adhesives containing up to 1000 ppm residual monomer of vinyl acetate (CAS No. 108–05–4).
- The classification H351 for titanium dioxide (CAS No. 13463–67–7).
- The classification H361 for 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6).

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

Background to requirement O19 classification of ingoing substances

The requirement has been made into a separate requirement and a ban on Category 2 substances has also been added. Nordic Ecolabelling would like to restrict the use of substances that are carcinogenic, mutagenic and toxic for reproduction (CMR) to the greatest extent possible. In other words, this requirement represents a further restriction on the classification requirement since it applies to ingoing substances in the chemical product.

Exemptions are given for adhesives that contain isocyanate classified H351 or formaldehyde classified H350 and H341, see more background in the previous requirement. Another common type of adhesive is PVAc adhesive where the polymer polyvinyl acetate is used as a binder. This adhesive may contain residual monomers of vinyl acetate classified H351. An exception of up to 1000 ppm residual monomer has been introduced, which is the same limit value that is found in the Nordic Ecolabel criteria for Chemical building products. After consultation, exemptions have also been added for titanium dioxide (CAS No. 13463–67–7) and 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6). Titanium dioxide is a white pigment used in many different types of products. 1,1,1-Trimethylolpropane (TMP) is used to coat titanium dioxide to make the titanium dioxide particles easier to disperse. About 90% of all titanium dioxide is coated with TMP. There are no substances yet that can replace titanium dioxide and TMP.

O20 Prohibited substances

The following substances must not be present as ingoing substance (See Definitions) in chemical products:

- Substances on the Candidate List*
- Substances that have been evaluated in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)**
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
    - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
    - List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called “Substances no longer on list”, and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn’t 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 on sub list II.

- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
    - Bronopol (CAS No. 52–51–7) may be present in the chemical product at a level of not more than 0.05% by weight

- Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one CAS No. 247–500–7; 2-methyl-4-isothiazolin-3-one CAS No. 220–239–6) may be present in the chemical product at a level of not more than 0.0015% by weight
- IPBC (Iodopropynyl butylcarbamate) may be present in the chemical product at a level of not more than 0.20% by weight
- Adhesives containing polychloroprene for production of mattresses and upholstered furniture if the emission of the rest monomer chloroprene (2-chloro-1,3-butadiene) is ≤ 1 µg/m3 after 3 days, measured with the chamber method EN ISO 16000 or equivalent methods. The exception is not valid for mattresses designed for children.

**** Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Isothiazolinones may be present in the chemical product at a level of not more than 0.05% by weight
- Butylhydroxytoluene (BHT, CAS No. 128–37–0)
- Aziridine and polyaziridines
- Bisphenol A, S and F
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates****
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

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

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

Background to requirement O20 prohibited substances

Substances on the Candidate List, PBT, vPvB and endocrine disruptors

The ban on substances on the Candidate List, substances that are PBT (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative) and the ban on substances that are potential endocrine disruptors in category 1 or 2 on the EU's priority list of substances for further evaluation of their role in endocrine disruption are new in this revision. The Candidate List contains substances of very high concern, so-called SVHC substances. SVHCs (Substances of Very High Concern) meet one or more of these criteria:

- Very harmful to health: carcinogenic, mutagenic, Toxic for reproduction (CMR substances, category 1A and 1B), set out in REACH, Article 57 a, b, c

- Very harmful to the environment: persistent, bio-accumulative and toxic (PBT) or very persistent and very bio-accumulative (vPvB), set out in REACH, Article 57 d, e
- Serious effects to human health or the environment on another basis than the groups above, but that give equivalent cause for concern (e.g. endocrine disruptors and inhaled allergens), set out in REACH, Article 57 f

SVHC may be included on the Candidate List with a view to later inclusion on the Authorisation List. This means that the substance becomes regulated (ban, phasing out or some other form of restriction). Nordic Ecolabelling prohibits Candidate List substances due to their hazardous properties. Other SVHC substances are addressed via bans on the use of PBT and vPvB substances, and requirements for classification of and ban of endocrine disruptors.

PBT (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative) are organic substances that are defined in Annex XIII of REACH and are generally undesirable in Nordic Swan Ecolabelled products.

Endocrine disruptors (EDs) are chemicals that alter the functioning of the endocrine (hormone) system and consequently cause adverse health effects. The term potential EDs is used for chemicals with properties that make them suspected to be EDs. The hormone system regulates many vital processes in living organisms and when normal signalling is disturbed, adverse effects may result. EDs raise high concern for their risk of causing serious negative impact on the environment as well as on human health specifically. Special concern is raised for effects on reproduction and development and about possible links to increases in public health diseases. While effects in wildlife populations have been confirmed, evidence is pointing to effects also in humans.

Harmonised scientific criteria for the identification of EDs are missing across different pieces of EU legislation. Few EDs have been identified in the legislation so far, compared to the numbers of potential EDs. Under these circumstances, the Nordic Swan Ecolabel excludes identified and potential EDs listed by the EU member state initiative “Endocrine Disruptor Lists” at www.edlists.org. The initiative is a voluntary collaboration, compiling and presenting a single repository of information about the current status of substances identified as EDs or being under ED evaluation in the EU.

A substance listed on any of List I; II; and/or III is excluded in the product group. List I contain substances identified as EDs at EU legislative level; List II contains substances under EU legislative ED evaluation; and List III is for substances considered by a national authority to have ED properties. All listed substances are excluded from all raw materials and products unless otherwise specified in the requirement, meaning that substances listed with reference to e.g., the Cosmetics Regulation are not only excluded from cosmetics.

The requirement concerns the main lists (List I-III) and not the corresponding sublists called “Substances no longer on list”. A substance which is transferred to a sublist is thus no longer excluded, unless it also appears on any of the other main lists I-III. However, special attention is needed concerning those List II substances which are evaluated under a regulation or directive which doesn’t have provisions for identifying EDs, e.g., the Cosmetics Regulation. Since it’s not within the scope of e.g., this regulation to identify EDs, it’s not clear how the substances will be handled at www.edlists.org once the evaluation (safety

assessment of the substances in cosmetics in this case) is finalised. Nordic Ecolabelling will evaluate the circumstances for substances on sublist II case-by-case, based on the background information indicated on the sublist.

The lists are dynamic, and the companies are responsible for keeping track of updates, in order to keep labelled products compliant with the requirement throughout the validity of the licences. Nordic Ecolabelling acknowledges the challenges associated with new substances being introduced on particularly List II and III, and in some cases also List I. We will evaluate the circumstances and possibly decide on a transition period on a case-by-case basis.

By excluding both identified and prioritised potential EDs which are under evaluation, the Nordic Swan Ecolabel ensures a restrictive policy on EDs.

Perfluorinated and polyfluorinated alkylated substances (PFAS)

Perfluorinated and polyfluorinated alkylated substances (PFAS) are a group of substances with undesirable properties. PFASs are defined as fluorinated substances containing at least one fully fluorinated methyl or methylene carbon atom (without any H / Cl / Br / I atom attached to it), i.e., with a few listed exceptions, all chemicals with at least one perfluorinated methyl group (–CF3) or a perfluorinated the methylene group (–CF2–) is a PFAS as described in OECD 2021.[27] The substances are persistent and are readily absorbed by the body.

PFASs are persistent in the environment and are known to remain in the environment longer than any other artificial substance. This means that as long as PFAS continues to be released into the environment, humans and other species will be exposed to an increasing concentration of PFAS. PFAS substances have often been shown to contaminate groundwater, surface water and soil. Remediation of contaminated sites is both technically difficult and costly. If the release continues, the PFASs will accumulate in the environment, in drinking water and in food.

Halogenated organic compounds

Halogenated organic compounds that contain halogenated compounds such as chlorine, bromine, fluorine or iodine must not be present in ecolabelled furniture and fitments. This includes halogenated flame retardants, chloroparaffins, perfluoroalkyl compounds and certain organic bleaching chemicals. It should be noted that PFOA (perfluoroctanic acid and salts/esters thereof) and PFOS (perfluoro octane sulphonic acid and compounds thereof), which appeared earlier as a separate item, are halogenated organic compounds. These can be used, for example, in paints and varnishes and in agents for waterproofing textiles and leather, which could be relevant to furniture/fitments. Halogenated organic compounds have different properties that are not desirable in Nordic Swan Ecolabelled products. They are harmful to human health and the environment, highly toxic to aquatic organisms, carcinogenic or harmful to health in other ways. The halogenated organic compounds do not break down readily in the environment, which increases the risk of harmful effects from the substances.

The preservatives bronopol, IPBC and CMIT/MIT with specific threshold limit values are exempt from the ban on halogenated compounds. There is also a restriction on

[27] https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/terminology-per-and-polyfluoroalkyl-substances.pdf 2021

isothiazolinone content (described in a separate section). The exemption is the same as in Version 4 for bronopol, isothiazolinones and CMIT/MIT, while IPBC is new to the list. IPBC is a fungicide that is now widely used, primarily in paint products. It is classified as harmful to the environment and allergenic. The threshold limit values are the same as in Nordic Ecolabelling's criteria for chemical building products. Water-based paints and adhesives used in the manufacture of furniture may contain the preservative bronopol and it is difficult to find substitutes. A limited amount of bronopol is therefore permitted although it is classified as a substance of concern and harmful to the environment. Isothiazolinones are used as a preservative in paints, lacquers and many other products, where they act as fungicides, biocides and algal growth inhibitors. They are toxic to aquatic organisms and can cause varying degrees of allergenic reactions. It has proved difficult to avoid the use of these preservatives in water-based products, which is what Nordic Ecolabelling's criteria for chemicals indirectly promote. Preservatives also play an important role in ensuring the shelf-life of the products before they are used. Alternative preservatives to isothiazolinones include formaldehyde and/or formaldehyde-releasing substances, which are carcinogenic. In this respect, isothiazolinone and CMIT/MIT are better, even if they also exhibit hazardous properties. To limit the use of these substances as much as possible, the amount of the substances is restricted. Restrictions on the amounts are the same as in the Nordic Swan Ecolabelling of interior paints and varnishes.

The exception for adhesives with polychloroprene is continued as it is difficult to find good enough alternatives to this adhesive that ensures good enough quality.

BHT

Butylhydroxytoluene (BHT, CAS No. 128–37–0) is new to the list of prohibited substances. BHT does not have an official harmonized classification and is not on the EU list of suspected endocrine disruptors that Nordic Ecolabelling refers to in another section of this requirement. However, BHT is on the Sin-list due to potential endocrine disrupting properties and on the CoRAP-list due to suspicion of endocrine disrupting effect, possible CMR and sensitizing properties. Nordic Ecolabelling places BHT on the list of prohibited substances due to the suspicion of very adverse health effects but introduces an exception for UV curing paints and paints (see chapter 2.10 Surface treatment). BHT has an important function in such products and can be difficult to replace. Nordic Ecolabelling does not want to prohibit the use of UV curing lacquers and paints as they have other positive properties such as low VOC content. If BHT receives a harmonized official classification that is not allowed in these criteria, then the exemption is no longer valid.

Alkylphenols, alkylphenol ethoxylates and/or alkylphenol derivates

Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD) are a group of non-readily degradable surfactants that are proven endocrine disruptors. APEOs may be present in binding, dispersing and thickening agents, siccatives, foam inhibitors, pigment pastes, wax, etc. Raw materials containing APEOs can be replaced with APEO-free alternatives based on alkyl sulphates, alkyl ether sulphates and alcohol ethoxylates. These are readily biodegradable but also have harmful properties, being toxic to aquatic organisms and some may be bioaccumulative. However, there is an environmental gain to be made by substitution since they break down rapidly and the degradation product, nonylphenol, with its endocrine-disrupting effects is avoided.

Bisphenol A, S and F

Bisphenol A, CAS No. 80–05–7, is used as a monomer in, inter alia, the following relevant areas and products: Various plastic and epoxy mixes, various building parts, paint, varnish, glue (binding agents, hardeners) and polyol in the production of polyurethane. Bisphenol A can be released into the environment from the production process. Bisphenol A (BPA) is on the Candidate List of substances that may have serious effects on human health and the environment and the goal is to eliminate emissions by 2020.[28] BPA is identified as damaging to the eyes, irritating to the respiratory tract, skin sensitizing and may also affect reproductive performance. The substance may be endocrine disrupting and is toxic to aquatic organisms. Bisphenol F and S can be used as substitutes for bisphenol A. A screening programme conducted to determine the occurrence of environmental toxins in surface water, sediment and biota in Norway found bisphenols A, F and S in the samples that were taken[29]. These are substances with the same properties as bisphenol A26.

Phthalates

The ban on phthalates has not been changed. Many phthalates are harmful to the environment and human health and should not be used in ecolabelled products for a variety of reasons. Some phthalates are on the EU's priority list of substances for further evaluation of their role in endocrine disruption, and some have already been identified as endocrine disruptors. Some phthalate compounds are also on the Candidate List. All are there because they are classified as toxic for reproduction. Some are also regulated in Annex XVII of REACH, and many phthalates are on the Danish Environmental Protection Agency's "List of Undesirable Substances" and on the Norwegian Environment Agency's "List of Priority Substances".

For precautionary reasons, Nordic Ecolabelling has decided to continue to exclude phthalates as a group, since this group contains many different phthalates with various properties.

Aziridine and polyaziridines

Aziridine and polyaziridines is classified H350 (carcinogenic) and H340 (mutagenic) and are thus covered by the ban on CMR substances. They are nevertheless on the list of banned substances to make it clear that they are banned. The substances were also on the list in Generation 4 of the criteria.

Volatile aromatic hydrocarbons (VAH)

The restriction on VAHs has not been changed. Volatile aromatic hydrocarbons (VAH) are volatile organic compounds where one or more benzene rings are contained within the molecule, e.g. toluene, benzene and xylene. VAHs are very stable and have a specific impact on the environment and human health, including damage to DNA[30]. Exposure to these products should be minimised. For this reason, no more than 1% by weight is permitted in the chemical product.

[28] https://tema.miljodirektoratet.no/no/Tema/Kjemikalier/Miljogifter/Bisfenol-A/
[29] Screening programme 2013: New bisphenols, organic peroxides, fluorinated siloxanes, organic UV filters and selected PBT substances, The Norwegian Environment Agency, Report M-176/2014
[30] Environ Health Perspect. 2002 June; 110 (Suppl 3): 451-488.

Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds

Nordic Ecolabelling restricts heavy metals because they are toxic to humans and other organisms, both on land and in the aquatic environment. Mercury, cadmium and lead are toxic to the human nervous system, kidneys and other organs, and the metals can accumulate in living organisms. Chromium (VI) is classified as very toxic, CMR and harmful to the environment.

O21 Nanomaterials

The chemical product must not contain nanomaterials* as ingoing substances (See Definitions). Exemptions apply to:

- Pigments**
- Naturally occurring inorganic fillers***
- Unmodified synthetic amorphous silica

** See definitions.*

*** This exception does not include pigments added for purposes other than colour.*
**** This applies to fillers covered by Annex V item 7 of REACH*

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

Background to requirement O21 nanomaterals

Due to the small size and large surface area of nanoparticles, they are usually more reactive and may have different properties than larger particles of the same material. There is concern among public authorities, researchers, environmental organizations, and others about the lack of knowledge about the potential harmful effects on health and the

environment [31],[32],[33],[34],[35],[36]. Coatings and other modifications can also change properties. Nordic Ecolabelling takes the concerns about nanomaterials seriously and uses the precautionary principle to exclude nanomaterials / particles in the products. The European Commission's definition of nanomaterials (2022/C 229/01) is used.

Most nanomaterials on the market today have either been in use for decades or existing materials have recently been manipulated into nanoforms.[37] For example, nanoparticles of carbon black and amorphous silica (SiO2) have been used in the last century. Titanium dioxide, TiO2, has long been used as a dye in bulk form, but is now produced as a nanomaterial for other purposes.[38] It is expected that other types of engineered nanomaterials will enter the market in the future.[39]

Within the product group furniture and fitments, nanomaterials are used, among other things, for impregnation or sealing of surfaces such as wood or metal, to create hydrophobic, self-cleaning, rust-resistant and antibacterial surfaces. These effects can be created by e.g. the addition of nanometals such as silver, gold and copper or titanium dioxide. The requirement has the following exceptions:

Pigments

Pigments are finely ground, insoluble particles that are used to give the products a certain colour. There are no substitutes that can perform the function of pigments such as dyes in

[31] UNEP (2017) Frontiers 2017 Emerging Issues of Environmental Concern. United Nations Environment Programme, Nairobi. https://wedocs.unep.org/bitstream/handle/20.500.11822/22255/Frontiers_2017_EN.pdf?sequence=1&isAllowed=y

[32] Parliamentary Assembly of the Council of Europe (2017 (2013)) Nanotechnology: balancing benefits and risks to public health and the environment. http://semantic-pace.net/tools/pdf.aspx?doc=aHR0cDovL2Fzc2VtYmx5LmNvZS5pbnQvbncveG1sL1hSZWYvWDJlLURXLWV4dHIuYXNwP2ZpbGVpZD0xOTczMCZsYW5nPUVO&xsl=aHR0cDovL3NlbWFudGljcGFjZS5uZXQvWHNsdC9QZGYvWFJlZi1XRC1BVC1YTUwyUERGLnhzbA==&xsltparams=ZmlsZWlkPTE5NzMw

[33] Larsen PB, Mørck TAa, Andersen DN, Hougard KS (2020) A critical review of studies on the reproductive and developmental toxicity of nanomaterials. European Chemicals Agency.

[33] SCCS (Scientific Committee on Consumer Safety) (2019) Guidance on the Safety Assessment of Nanomaterials in Cosmetics. SCCS/1611/19. https://ec.europa.eu/health/sites/health/files/scientific_committees/consumer_safety/docs/sccs_o_233.pdf

[34] Mackevica A, Foss Hansen S (2016) Release of nanomaterials from solid nanocomposites and consumer exposure assessment - a forward-looking review. Nanotoxicology 10(6):641–53. doi: 10.3109/17435390.2015.1132346

[35] BEUC – The European Consumer Organisation et. al (2014) European NGOs position paper on the Regulation of nanomaterials. www.beuc.eu/publications/beuc-x-2014-024_sma_nano_position_paper_caracal_final_clean.pdf

[36] Azolay D and Tuncak B (2014) Managing the unseen – opportunities and challenges with nanotechnology. Swedish Society for Nature Conservation. www.naturskyddsforeningen.se/sites/default/files/dokument-media/rapporter/Rapport-Nano.pdf

[37] EU observatory for nanomaterials and European Chemicals Agency (2019) What are next generation nanomaterials and why are regulators interested in them? Information note. https://euon.echa.europa.eu/documents/23168237/24095696/190919_background_note_next_gen_materials_en.pdf/b9178324-5a69-2e4b-1f2b-aac2c2845f45

[38] European commission, COMMISSION STAFF WORKING PAPER, Types and uses of nanomaterials, including safety aspects, Accompanying the [..] second regulatory review of nanomaterials, SWD(2012) 288 final

[39] EU observatory for nanomaterials and European Chemicals Agency (2019) What are next generation nanomaterials and why are regulators interested in them? Information note. https://euon.echa.europa.eu/documents/23168237/24095696/190919_background_note_next_gen_materials_en.pdf/b9178324-5a69-2e4b-1f2b-aac2c2845f45

paints, inks, textile dyes, masterbatch etc. and many pigments consist wholly or partly of nanoparticles. Therefore, nano-sized pigments are excluded. Although no clear conclusions can be drawn about the safety of nanopigments[40], release by weathering of facades is very limited, and the nanoparticles are probably mainly embedded in the paint matrix rather than being released as single nanoparticles[41],[42]. Paint pigments consist of particles of individual crystals up to aggregates of several crystals. It is generally more efficient to use pigments with smaller particles than larger ones to get the same colour. Inorganic pigments used in the paint industry, which can occur in nano-size, include carbon black and iron oxides[43]. Carbon black used in paints is very finely ground and has a particle size of approx. 10–30 nm[44]. Iron oxide pigment may comprise only nanosized particles, or only a fraction of the particles may be nano. Inorganic nano pigments are also added to products for a variety of purposes other than dyeing. Nano-titanium dioxide, for example, is used to provide a self-cleaning effect in paints.

Naturally occurring inorganic filler

Traditional fillers are allowed. Naturally occurring fillers from e.g. chalk, marble, dolomite, and lime are exempted from registration in accordance with Annex V, point 7 of REACH as long as these fillers are only physically processed (painted, sifted, etc.) and not chemically modified. An exemption for inorganic fillers has been added as long as they are covered by Annex V, point 7 of REACH.

Synthetic amorphous silica

Synthetic amorphous silica (SAS) is a produced silica (SiO2) that has been used in industrial, consumer and pharmaceutical products for decades.[45] SAS is a nanomaterial according to the EU Commission's definition and is exempt from the requirement due to a lack of alternative substances.

Polymer dispersions can technically be considered as nanomaterials: the European Commission's follow-up report to the second "Regulatory Review on Nanomaterials" from 2012[46] states that solid nanomaterials dispersed in a liquid phase (colloid) should be considered as nanomaterials in accordance with the European Commission's recommendation. Polymer dispersions are not exempt from the requirement, as they are not considered relevant for furniture.

[40] Hynes J, Novotný T, Nic M, Kocurkova L, Prichystalová R, Brzicová T, Bernatikova S (2018) Literature study on the uses and risks of nanomaterials as pigments in the European Union. European Chemicals Agency.
[41] Mackevica A, Hansen, SF (2016) Release of nanomaterials from solid nanocomposites and consumer exposure assessment – a forward-looking review. Nanotoxicology, 10(6), 641–653. https://doi.org/10.3109/17435390.2015.1132346
[42] Nowack B, Hincapié I, Sarret G, Larue C, Legros S (2013) Environmental fate of nanoparticles from façade coatings. NanoHouse Dissemination report Nº 2013-03. https:// DOI: 10.13140/2.1.2206.3040
[43] Industrial Organic Pigments; W. Herbst, K. Hunger; Third edition 2004; pp. 120–124
[44] Coatings Handbook; Thomas Brock, Michael Groteklaes, Peter Mischke; 2000; p. 128
[45] https://www.asasp.eu/images/Publications/Nano_-_SAS_factsheet_-_201209.pdf
[46] Communication from the commission to the european parliament, the council and the european economic and social committee, Second Regulatory Review on Nanomaterials, COM(2012) 572 final

O22 VOCs in adhesives

VOCs (volatile organic compounds) may not account for more than 3% by weight of the adhesive.

VOC are defined as any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101.3 kPa (the same definition that appears in the VOC Directive 2004/42/EC).

- A declaration from the adhesive producer that the requirement has been met.

Background to requirement O22 VOCs in adhesives

Volatile organic compounds are of particular concern due to their inherent properties. They can be absorbed through the lungs and skin and cause damage to various organs. Prolonged exposure to certain organic solvents can cause chronic damage to the brain and nervous system, while other organic solvents can cause cancer or reproductive damage.[47]

O23 Free formaldehyde

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

The content of free formaldehyde in adhesives must not exceed 0.2% by weight (2,000 ppm). The requirement applies to the adhesive before any mixture with a hardener.

- A declaration from the manufacturer/supplier of the chemical product.

Background to requirement O23 free formaldehyde

Formaldehyde is a toxic and allergenic substance (H317) that has carcinogenic effects (H351) and should therefore be avoided as far as possible. Formaldehyde is exempted where it appears in the form of impurities and in adhesives where it is difficult to avoid this. The purpose of the requirement is to restrict the content of formaldehyde in products in order to limit formaldehyde emissions. Nordic Ecolabelling does not want to request a specific test for this, because that would be too extensive and costly for each chemical product. However, Nordic Ecolabelling can ask for a test if there is any uncertainty about the declaration.

Most of the formaldehyde present in adhesives occurs as free formaldehyde. However, formaldehyde can also originate from the components in the adhesive (such as preservatives). Adhesives emit formaldehyde during both polymerisation and the hardening phase. Free formaldehyde reacts when the adhesive is applied to wood or other components, and when the adhesive has hardened/dried, formaldehyde can be released through degradation processes. It is possible to control and set requirements to the amount of free formaldehyde in the glue, in the mixture or in dried glue, but not for what occurs when the adhesive is applied to a surface. This is because neither the adhesive manufacturer nor Nordic Ecolabelling are able to control or influence the choice of wood /material to which the adhesive is applied.

The limit values for free formaldehyde have been tightened compared with the previous criterion generation 4. For chemical products other than adhesives, the limit value has been

[47] http://www.epa.gov/iaq/voc.html

tightened from 0.2 to 0.02% by weight. The formulation of the requirement and limit value has been harmonized with the Nordic Ecolabel's house criteria generation 3 and criteria for chemical building products.

The requirement has been clarified after consultation and the exemption for adhesives mixed with hardeners has been removed. Adhesives may contain a maximum of 0.2% by weight of free formaldehyde and the requirement applies to the pure adhesive. This requirement applies to adhesives used in e.g. the final assembly of the furniture. Adhesives used in the manufacture of wood-based panels must meet later chemical requirements where there are no requirements for free formaldehyde but instead formaldehyde emission.

5.4 Solid wood, cork and bamboo

The requirements in Chapter 5.4 apply to solid wood, cork and bamboo. Panels made of wood, cork and bamboo are covered by requirements in section 5.5.

Furniture parts made of reused solid wood, cork or bamboo are exempted from requirements O27 and O28.

Molded veneer sheets are also included in this chapter and the glue used in the molded veneer sheets must meet the chemical requirements in Chapter 5.3.

5.4.1 Requirements that apply irrespective of quantity in the product

O24 Chemicals in reused parts

– The previous application area for reused* parts must be specified.

– Reused parts made of solid wood, cork, or bamboo must be untreated.

**Reused parts mean parts that have previously been used in another product (post-consumer).*

T̄ A specification of what the reused part has been used for and a declaration confirming it is untreated. Nordic Ecolabelling may request additional documentation if compliance is uncertain.

Background to requirement O24 chemicals in reused parts

Nordic Ecolabelling wants to promote reuse. This possibility will be relevant for a very small part of the manufacturers on the market, but there may be some cases where this is a possibility. The requirement that the application of use and that the wood must be untreated narrows the opportunities for using such wood. However, Nordic Ecolabelling has decided to be restrictive as it is difficult to know what types of chemicals are used. The requirement makes no distinction between timber used for interior applications and timber used for outdoor applications. However, since it must be untreated, pressure-impregnated timber, creosote, etc. cannot be used.

O25 Tree species with restricted use

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

a) CITES (Appendices I, II and III)

b) IUCN red list, categorized as CR, EN and VU

c) Rainforest Foundation Norway´s tree list

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

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

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

- the tree species does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU.
- the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002: http://www.intactforests.org/world.map.html.
- the tree species must originate from FSC or PEFC certified forest/plantation and must 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 plantation shall in addition not originate from plantations established on areas converted from forest after 1994.

**The list of restricted tree species is located on the website: Forestry requirements (nordic-swan-ecolabel.org)*

- Declaration from the applicant/manufacturer/supplier that tree species listed on a-d) are not used.

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

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

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

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

Background to requirement O25 trees with restricted use

Several tree species are restricted or not permitted for use in Nordic Swan Ecolabel products. Many of the restricted tree species are grown in countries which still have large areas of Intact Forest Landscape (IFLs). These are important to protect due to biodiversity and climate. A lot of these countries also have a high risk of corruption, and the national

legislation related to environment, human rights and ownership to land are weak and/or not controlled by the authorities. Applying a precautionary approach, the use of listed restricted tree species must comply with strict requirements on origin, traceability and certification.

The list of prohibited species contains species on the CITES list while the list of restricted species contains species on the IUCN red list (categorized as critically endangered (CR), endangered (EM) and vulnerable (VU)), Rainforest Foundation Norway list and Siberian Larch (originated outside the EU). Restricted species can be used in Nordic Swan Ecolabelled products if certain strict conditions on origin, certification and traceability are met.

The requirement only applies to virgin wood and not wood defined as recycled material in accordance with ISO 14021. For more information about Nordic Swan Ecolabelling's approach on forest, click here.

5.4.2 Requirement for furniture/fitments containing ≥ 10% wood, bamboo or cork by weight

O26 Traceability and certification

The requirement applies to furniture/fitments containing more than 10 weight % of wood/bamboo/cork:

Species name

Applicant/manufacturer/supplier must state the name (species name of the wood raw material / bamboo / cork) that are used in the Nordic Swan Ecolabelled furniture/fitment.

Chain of custody certification

The applicant/manufacturer of the furniture/fitment or the applicant's/manufacturer's subcontractors of wood raw materials/bamboo/cork must hold a valid FSC/PEFC chain of custody (CoC) certification.

Exception: a subcontractor (e.g. a carpentry workshop) of the applicant that does not have CoC certification may also be approved. This is subject to a guarantee from the subcontractor 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 subcontractor must guarantee that the certified wood is sold to the manufacturer of the Nordic Swan Ecolabelled product. The applicant must have an agreement with the subcontractor which describes how the subcontractor guarantees that the certified timber will be delivered to the applicant. The agreement shall state that the subcontractor is obliged to report to the applicant when changing wood supplier.

Certified wood raw materials, willow, bamboo, and cork

A minimum of 70% by weight of all wood raw materials, bamboo and cork used in the Nordic Swan Ecolabelled product must origin from forest managed according to sustainable forestry management principles that meet the requirements set out by FSC or PEFC chain of custody schemes.

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

If the furniture manufacturer is chain of custody certified the following applies:

The manufacturer must provide evidence with a balance sheet from the company's accounting system correctly showing account for and allocated inputs and outputs of certified wood raw material and of any material from "controlled" sources, to their manufacturing facility and resulting Nordic Swan Ecolabelled products.

If the subcontractor is chain of custody certified the following applies:

The furniture manufacturer must submit documentation on the purchase of wood raw material from the CoC-certified subcontractor which shows that the certification requirement of at least 70% certified is fulfilled and that the remaining share is covered by the control schemes (FSC controlled wood / PEFC controlled sources). This must be specified on the invoice / delivery note with certification claim. The furniture manufacturer must ensure that the wood raw material specified on the invoice is used in the production of the Nordic Swan Ecolabelled product.

- The names (species names) of the wood raw materials, bamboo and cork that are used.
- The applicant/furniture manufacturer or supplier must provide valid FSC/PEFC CoC certification that includes all wood raw materials, bamboo and cork used in the Nordic Swan Ecolabelled furniture/fitment.

If the furniture manufacturer is chain of custody certified:

- The applicant shall provide audited accounting documents that demonstrate that at least 70% of the materials allocated to the Nordic Swan Ecolabelled product or production line originate from forests or areas managed according to sustainable forestry management principles that meet the requirements set out by FSC or PEFC chain of custody scheme. If the product or production line includes uncertified virgin material, proof shall be provided that the content of uncertified virgin material does not exceed 30% and is covered by a verification system that ensures that it is legally sourced and meets any other requirement set out by FSC or PEFC with respect to uncertified material.

If the subcontractor is chain of custody certified:

- Documentation from the furniture manufacturer on the purchase of wood raw material from the CoC-certified subcontractor which shows that the certification requirement of at least 70% certified is fulfilled and that the remaining share is covered by the control schemes (FSC controlled wood / PEFC controlled sources). This must be specified on the invoice / delivery note with certification claim. The furniture manufacturer must declare that the wood raw material that fulfils the requirement is used in the Nordic Swan Ecolabelled production.
- If an applicant does not have a subcontractor with chain of custody certification, the subcontractor must present invoices for the wood raw materials in question from a supplier of wood with chain of custody certification and that supplier’s CoC certificate, which must correspond exactly with the invoices. Volumes of purchased certified wood raw materials must be stated on the invoices. The applicant must have a contract with the subcontractor that describes how it guarantees that the certified wood specified on the invoice is delivered to the applicant. It must also be stated in the contract that the subcontractor is required to inform the applicant if their supplier of wood is changed. Nordic Ecolabelling may request further information. The furniture manufacturer must declare that the wood raw material that is delivered from the subcontractor and fulfils the requirement of certified and controlled share is used in the Nordic Swan Ecolabelled production.

Background to requirement O26 traceability and certification

Nordic Ecolabelling's forestry requirement focuses on sustainable forestry and the traceability of the wood raw materials. The requirement also includes willow, bamboo and cork. These materials are used in furniture, although they are not very common. There is, for example, FSC certified bamboo.

The many benefits that sustainably managed forests deliver to society include wood for materials and energy, protection against global warming, homes and livelihoods for local communities and indigenous peoples, support of biodiversity and protection of water and soil from pollution and erosion. By setting a requirement that wood raw materials must originate from certified, responsible managed forests, Nordic Ecolabelling is supporting the move towards more sustainable forestry practices.

Nordic Ecolabelling requires a declaration of the species of wood contained in the Nordic Swan Ecolabelled product. This makes it possible to check the validity of Chain of Custody certificates in the supply chain. The requirement for CoC certification improves the traceability of materials in the supply chain within the guidelines and control systems of the FSC and PEFC. The company's CoC certification proves how certified wood is kept separate from other wood during production, administration and storage and is inspected annually by independent certification bodies. Under this requirement, CoC certification must be held by either the applicant/manufacturer or the supplier of wood raw materials. Nordic Ecolabelling considers it is too strict to require the applicant/furniture manufacturer to hold CoC certification. If the applicant/furniture manufacturer has CoC certification and is able to label the finished product with the FSC/PEFC logo, there is a requirement that the certified wood raw material is allocated i to the Nordic Swan Ecolabelled product. This ensures that FSC/PEFC credits are used for the Nordic Swan Ecolabelled production and that the credits are not sold twice. This will stimulate increased demand for certified wood raw materials because more certified wood raw materials must be purchased if the manufacturer wants to label other products, and not just the Nordic Swan Ecolabelled products, with the FSC/PEFC logo. It also means that a Nordic Swan Ecolabelled product can have both the Nordic Swan Ecolabel logo and the FSC/PEFC logo. However, there is no requirement for the applicant/furniture manufacturer to have CoC certification. If CoC certification is held by the supplier, the applicant/furniture manufacturer must have documentary evidence of purchase of certified raw material in the form of claims on the invoice or delivery note, showing that a minimum of 70% certified wood raw material has been purchased. Please note that Nordic Ecolabelling approves both the percentage system and the credit system for bookkeeping and sales of certified material.

It is also possible to not use a subcontractor that is CoC-certified. This is because the furniture industry often has small, local suppliers that have good control of the wood raw materials that they purchase, even if they do not have chain of custody certification. In such cases, it should be possible to document that wood raw materials are purchased from certified areas.

The requirement has increased the minimum percentage to 70% for all wood species. Previously, this requirement only applied to pine, fir, birch and tropical wood. Tropical wood is now largely covered by the requirement concerning restricted tree species. Public sector tenders often require a certification percentage of 70%. The remaining percentage of wood raw materials must be FSC Controlled Wood or wood from PEFC Controlled Sources. The

minimum requirement set by FSC and PEFC for the use of their logos on products is also 70%.

5.5 Panels made of wood and/or bamboo

The requirements in Chapter 5.5 apply to wood-based panels such as chipboard, fibreboard (including MDF and HDF panels), OSB (Oriented Strand Board), veneer (plywood and parallel-laminated veneer panels) and solid wood panels (corresponding to non-load bearing laminated wood panels or DIY panels). The requirements also cover equivalent products made of bamboo.

O27 Ecolabelled panels

If the panel is Nordic Swan Ecolabelled in accordance with the Nordic Swan Ecolabel criteria for Construction and facade panels, generation 6 or later, the requirements in this chapter (5.5) are fulfilled. However, all other chapters must still be fulfilled.

- Name, manufacturer and licence number of the panel.

O28 Tree species with restricted use

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

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

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

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

- the tree species does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU.
- the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002: http://www.intactforests.org/world.map.html.
- the tree species must originate from FSC or PEFC certified forest/plantation and must 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 plantation shall in addition not originate from plantations established on areas converted from forest after 1994.

**The list of restricted tree species is located on the website: Forestry requirements (nordic-swan-ecolabel.org)*

- Declaration from the applicant/manufacturer/supplier that tree species listed on a-d) are not used.

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

- The applicant/manufacturer/supplier are required to present a valid FSC/PEFC Chain of Custody certificate that covers the specific tree species and demonstrate that the tree is controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.
- The applicant/manufacturer/supplier are required to document full traceability back to the forest/certified forest unit thereby demonstrating that;
  - the tree does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU;
  - the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 http://www.intactforests.org/world.webmap.html;
  - for plantations, the applicant/manufacturer/supplier must document that the tree species does not originate from plantations established on areas converted from forest after 1994.

Background to requirement O28 tree species with restricted use

Se background to requirement O25.

5.5.1 Requirements if the panel accounts for more than 5% of the product by weight

O29 Chemicals in wood-base panels with recycled materials

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

This means that the materials must not come from:

- Treated wood: wood that contains halogenated organic compounds or heavy metals as a result of treatment with wood preservatives.
- Wood that exceeds the threshold limit values in the table below:

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

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

- For wood-based panels: Certification of compliance with the EPF's Standard for delivery conditions of recycled wood, 2002, or subsequent versions, and any

equivalent documentation/test report e.g. documentation in accordance with the German waste wood ordinance, 2002 or later, showing compliance with the requirements of the standard.

Background to requirement O29 chemicals in wood-based panels with recycled materials

The requirement is made to provide better control over what types of recycled materials are being used and to prevent the use of materials containing substances of concern. The requirement concerning wood-based panels is the same as the requirement made in the EU Ecolabel criteria for furniture. Compliance with this standard is relatively common in the EU but it is important to ensure that production outside the EU also complies with the requirements of the standard. Requirements are imposed on the content of several heavy metals and creosote. If it can be documented that the requirements of the German Waste Wood Ordinance, 2002 or later have been met, this will also be approved as documentation.

O30 Classification of chemical products

Chemical products used in the production of wood-based panels must not have any of the classifications listed in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372

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

Note that responsibility for correct classification lies with the manufacturer.

Exemptions apply to:

- The classification H351 for adhesive containing methylene diphenyl diisocyanate (MDI).

- The classifications H350, H341, H301, H311 and H331 for resins containing formaldehyde (CAS No. 50–00–0). Emissions of formaldehyde from the laminate are regulated in a separate requirement.
- The classifications H301, H311, H331 and H370 for resins containing a maximum of 10% by weight of methanol (CAS No. 67–56–1)
- The classifications H351 and H361 for resins containing melamine (CAS No. 108–78–1).
- The classifications H341, H301 and H331 for resins containing a maximum of 10% by weight of phenol (CAS No. 108–95–2) used in plywood.

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

O31 Classification on ingoing substances

Ingoing substances (See Definitions) in the chemical products used in the production of wood-based panels must not have any of the classifications in the table below:

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemptions apply to:

- The classification H351 for adhesive containing methylene diphenyl diisocyanate (MDI).
- The classification H350 and H341 for adhesives containing formaldehyde (CAS No. 50–00–0), if the requirement to free formaldehyde, which is regulated in a separate requirement, is fulfilled.
- The classification H361 for titanium dioxide (CAS No. 13463–67–7) classified H351 and 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6).
- The classifications H350 and H341 for resins containing formaldehyde (CAS No. 50–00–0). Emissions of formaldehyde are regulated in a separate requirement.
- The classification H341 for resins containing a maximum of 10% by weight of phenol (CAS No. 108–95–2) used in plywood.

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

O32 Prohibited substances

The following substances must not be present as an ingoing substance (See Definitions) in chemical products:

- Substances on the Candidate List*
    - Exemption applies to: melamine (CAS No. 108–78–1)
- Substances that have been evaluated in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)**
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
    - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
    - List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn't 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 on sub list II.

- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
    - Bronopol (CAS No. 52–51–7) may be present in the chemical product at a level of not more than 0.05% by weight
    - Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one CAS No. 247–500–7; 2-methyl-4-isothiazolin-3-one CAS No. 220–239–6) may be present in the chemical product at a level of not more than 0.0015% by weight
    - IPBC (Iodopropynyl butylcarbamate) may be present in the chemical product at a level of not more than 0.20% by weight

*** *Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Isothiazolinones may be present in the chemical product at a level of not more than 0.05% by weight
- Butylhydroxytoluene (BHT, CAS No. 128–37–0)
- Aziridine and polyaziridines
- Bisphenol A, S and F
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates****
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds

- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

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

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

O33 Nanomaterials

The chemical product must not contain nanomaterials* as ingoing substances (See Definitions). Exemptions are made for:

- Pigments**
- Naturally occurring inorganic fillers***
- Unmodified synthetic amorphous silica

**In accordance with the definition of a nanomaterial adopted by the European Commission (2022/C 229/01)), see definitions.*

*** This exception does not include pigments added for purposes other than colour.*
**** This applies to fillers covered by Annex V item 7 of REACH*

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

O34 VOCs in adhesives

VOCs (volatile organic compounds) may not account for more than 3% by weight of the adhesive.

- A declaration from the adhesive producer that the requirement has been met.

Background to requirements O30–O34

See background text to requirement O18 to O22.

O35 Emission of formaldehyde

Wood-based panels that contain formaldehyde-based adhesive must meet one of the following requirements (a or b):

a) The emission of formaldehyde shall on average not exceed 0.062 mg / m3 air in accordance with test method EN 717–1.

b) Emissions of formaldehyde shall on average not exceed 0.124 mg / m3 air according to test method EN 16516.

The requirement applies to the raw wood-based panel. For panels coated with e.g. melamine O55 must be met.

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

Background to requirement O35 emission of formaldehyde

In the manufacture of wood-based panels, adhesive systems containing formaldehyde are often used. The development shows reduced emissions of formaldehyde from the finished panel. Formaldehyde is a toxic, sensitizing, and carcinogenic substance that Nordic Ecolabelling wants to limit as far as possible both 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 harmonized standard EN 13986. The current lowest emission class is E1 where the limit values are a maximum of 0.124 mg/m3 according to test method EN 717–1. Work is underway on a new common statutory lower limit value in the EU. Nordic Ecolabelling monitors this work and will review all criteria with requirements for formaldehyde emissions when the limit value has been decided.

On 1 January 2020, Germany introduced a new legal requirement which means that the reference method for measuring formaldehyde emission has been changed from the previous EN 717–1 to EN 16516. If the method EN 16516 is used, the limit value is the same as that for E1, 0.124 mg / m3. If, on the other hand, EN 717–1 is used as a method, the panel must meet a limit value of half E1 (0.062 mg / m3). The method EN 16516 was not included in the requirement in the consultation proposal, but as the new legal requirement in Germany will probably mean that this method will become standard for external testing in Europe, it has been added. Tests according to EN 16516 give a higher result than EN 717–1, but there is no exact correlation between the methods yet.

After the consultation, Nordic Ecolabelling has chosen to only refer to methods EN 717–1 and EN 16516 with the same limit values as the legal requirement in Germany. Other test methods can be approved if an independent third party (e.g. a test institute) has made a correlation. The change gives a stricter level for wood-based panels that are tested in accordance with EN 717–1, and it will be the largest tightening for MDF / HDF that previously had its own slightly higher limit value. It is unclear whether the requirement will be stricter for panels that are tested in accordance with EN 16516. Nordic Ecolabelling wishes to have the same limit values as the German legal requirement as a Nordic Swan Ecolabelled furniture is otherwise not automatically legal in Germany.

5.5.2 Requirement when panels make up more than 10% by weight of the furniture/fitment

O36 Traceability and certification of wood raw materials in panels

Species name

Applicant/manufacturer/supplier must state the name (species name) of the wood raw materials/bamboo that is used in the panel.

Chain of custody certification

The manufacturer/supplier of the panel must have a valid Chain of Custody certification under the FSC/PEFC schemes.

Exemption: Manufacturers who only use recycled* material in the production are exempt from the requirement for Chain of Custody certification.

Certified material

A minimum of 70% by weight of all wood raw materials/bamboo used in the panel must origin from forest managed according to sustainable forestry management principles that meet the requirements set out by FSC or PEFC chain of custody schemes.

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

If the furniture manufacturer is chain of custody certified the following applies:

The furniture manufacturer must provide evidence with a balance sheet from the company's accounting system correctly showing account for and allocated inputs and outputs of certified wood raw material and of any material from "controlled" sources, to their manufacturing facility and resulting Nordic Swan Ecolabelled products.

If the manufacturer of the panel is chain of custody certified the following applies:

The furniture manufacturer must submit documentation on the purchase of panels from the CoC-certified manufacturer/supplier which shows that the certification requirement of minimum 70% certified is fulfilled and that the remaining share is covered by the control schemes (FSC controlled wood / PEFC controlled sources). This must be specified on the invoice / delivery note with certification claim. The furniture manufacturer must ensure that the wood raw material specified on the invoice is used in the production of the Nordic Swan Ecolabelled product.

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

- The manufacturer/supplier of the panel must state the name (species name) of the wood raw materials used in the construction panel.

- Valid FSC/PEFC Chain of Custody certification from the manufacturer/supplier of panels, or the furniture manufacturer. Manufacturers that only use recycled materials are exempt from this requirement.

If the furniture manufacturer is chain of custody certified:

- The furniture manufacturer shall provide audited accounting documents that demonstrate that a minimum 70% of the material allocated to the Nordic Swan Ecolabelled product or production line originate from forests or areas managed according to sustainable forestry management principles that meet the requirements set out by FSC or PEFC chain of custody scheme. If the product or production line includes uncertified virgin material, proof shall be provided that the content of uncertified virgin material does not exceed 30% and is covered by a verification system that ensures that it is legally sourced and meets any other requirement set out by FSC or PEFC with respect to uncertified material. Recycled fibres that are not certified in accordance with FSC / PEFC must be covered by EN 643 delivery notes.

If the subcontractor is chain of custody certified:

- Documentation from the furniture manufacturer on the purchase of wood raw material from the CoC-certified subcontractor which shows that the certification requirement of at least 70% certified is fulfilled and that the remaining share is covered by the control

schemes (FSC controlled wood / PEFC controlled sources). This must be specified on the invoice / delivery note with certification claim. Recycled fibres that are not certified in accordance with FSC / PEFC must be covered by EN 643 delivery notes. The furniture manufacturer must declare that the wood raw material that fulfils the requirement is used in the Nordic Swan Ecolabelled production.

Background to requirement O36 traceability and certification of wood raw materials in panels

See the background to O26.

O37 Energy requirements for wood-based panels

The following applies to energy consumption in the manufacture of:

Chipboard:

No more than 7 MJ/kg per panel can be used in the production of the panel (excluding any surface treatment).

Wood based panels – wet process:

No more than 14 MJ/kg per panel can be used in the production of the panel (excluding any surface treatment).

Other panels:

No more than 11 MJ/kg per panel can be used in the production of the panel (excluding any surface treatment).
A detailed description of how the energy calculation is to be done is given in Appendix 2.

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

O38 Emissions to water in wet processes

For panels manufactured with wet processes, the COD emission to water must be maximum 20 g COD/kg product.

- Measurement results for the last 12 months, including information on the sampling program, measurement method and measurement frequency. For processing and analysis methods, see Appendix 1.

Background to requirement O37 and O38 energy and emissions

The energy requirement is the same as in the criteria for the Nordic Swan Ecolabelling of construction panels and has thus been changed. On 24 May 2022, a separate requirement limit was also introduced for wood-based panels produced using a wet process. This is relevant to use in doors where the panel has a sound-absorbing function. The requirement limit is based, among other things, on information available in EPDs[48],[49]. The requirement limit is somewhat higher than for other panels produced by dry process, but there is a lower chemical consumption as the binder is lignin from the wood itself. In addition, a requirement

[48] EPD Huntonitt bygningsplater, 2020 (https://www.epd-norge.no/getfile.php/1316491-1607606494/EPDer/Byggevarer/Bygningsplater/NEPD-2585-1312_Huntonit-bygningsplater.pdf)
[49] EPD, Steico SE: Steico wood fibre insulation boards manufactured in a wet process (2020)

for COD emission was introduced, as this is a relevant parameter in the wet process. The requirement limit is corresponding to the requirement in the criteria for Nordic Ecolabelling of building and construction panels.

In order to reduce CO2 emissions and limit global warming, it is important to reduce energy consumption. The main objective of the Nordic Swan Ecolabel's energy requirement is to help improve energy efficiencies. The requirement therefore applies to energy consumed per kg per panel (MJ/kg per panel). Because the panels are produced in varying thicknesses, using MJ/m2 as a parameter in an energy requirement for the production of panels does not enable comparison. Further background information can be found in the background document for Nordic Swan Ecolabelled Construction panels.

5.6 Paper

Paper can form part of the furniture, e.g. paper braids/cords on chairs. Paper is a renewable material, which Nordic Ecolabelling is positive towards. There are other specific requirements for paper included in laminates such as HPL, see chapter 5.7 Laminate.

The requirements apply if paper accounts for more than 5% of the product by weight.

5.6.1 Wood raw materials in the paper

O39 Tree species with restricted use

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

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

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

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

- the tree species does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU.
- the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 http://www.intactforests.org/world.map.html.
- the tree species must originate from FSC or PEFC certified forest/plantation and must 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 not originate from plantations established on areas converted from forest after 1994.

**The list of restricted tree species is located on the website: https://www.nordic-swan-ecolabel.org/pulp-paper-declaration-portal/what-can-be-declared/forestry-requirements/*

T̄ Declaration from the applicant/manufacturer/supplier that tree species listed on a-d) are not used.

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

- The applicant/manufacturer/supplier are required to present a valid FSC/PEFC Chain of Custody certificate that covers the specific tree species and demonstrate that the tree is controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.
- The applicant/manufacturer/supplier are required to document full traceability back to the forest/certified forest unit thereby demonstrating that;
  - the tree does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU;
  - the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 http://www.intactforests.org/world.webmap.html;
  - for plantations, the applicant/manufacturer/supplier must document that the tree species does not originate from plantations established on areas converted from forest after 1994.

Background to requirement O39 tree with restricted use

See background to O25.

O40 Traceability and certification of wood raw materials

Species name

The supplier/producer of the paper must state the name (species name) of the wood raw materials that is used in the paper.

Chain of custody certification

The manufacturer/supplier of the paper must have a valid Chain of Custody certification under the FSC/PEFC schemes.

Certified wood raw materials

Compliance with one of the following three alternatives is required, on an annual basis:

a) 70% of the fibre raw material in the paper must be certified by the FSC or the PEFC scheme.

b) The paper must be labelled FSC or PEFC Recycled. Alternatively, 70% of the fibre raw material must consist of recycled fibres.

c) If less than 70% of the fibre raw material content in the paper is recycled fibre, the percentage of fibre raw material that must be sourced from certified forests is calculated using the following formula:

$$Y\ (\%) \geq 70 - x$$

Y = Percentage of fibre raw material from certified forests
x = Percentage of recycled fibre

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

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

- The manufacturer/supplier of the paper must state the name (species name) of the wood raw materials used in the paper.
- Valid FSC/PEFC Chain of Custody certification from the manufacturer/supplier of the paper. Manufacturers that only use recycled materials are exempt from this requirement.
- Certified wood fibre option a): The furniture manufacturer must document that paper is purchased from the traceability-certified subcontractor which shows that the certification of at least 70% certified has been met, and that the remainder is covered by requirement the control schemes (FSC controlled wood / PEFC controlled sources). This must be specified on the invoice / delivery note with certification claim.
- Certified wood fibre option b): An invoice between the furniture manufacturer and paper manufacturer showing the purchase of FSC or PEFC Recycled labelled paper. Or a declaration of compliance with the requirement for recycled fibre content from the paper manufacturer. Recycled fibres not covered by FSC/PEFC chain of custody certificates must be covered by delivery notes of paper for recycling in accordance with EN 643.
- Certified wood fibre option c): Paper manufacturer's calculation of the percentage of fibre raw material that is FSC/PEFC certified and recycled, and documentation showing that paper with the certified amount is purchased. This should be specified in e.g. invoices or delivery note.
- The furniture manufacturer must declare that the paper that meets the requirements for certification / recycled share is used in the production of the Nordic Swan Ecolabelled product.

Background to requirement O40 traceability and certification of wood raw materials

See the background to O26.

5.6.2 Chemicals in the manufacture of pulp and paper

O41 Chemicals in the manufacture of pulp and paper

Chemicals used in the manufacture of pulp and paper must meet the requirements contained in the Chemical Module for Nordic Ecolabelling of paper, Version 3 or subsequent versions.

- Documentation in compliance with the requirements contained in the Chemicals Module, Version 3.

Background to requirement O41 chemicals in the manufacture of pulp and paper

Nordic Ecolabelling has long experience of setting requirements for paper production. The requirements to be met have recently been revised and the result is the chemical module generation 3 for the production of pulp and paper. The chemical module contains, among other things, requirements for the classification of chemicals, specific requirements for classified residual monomers and a ban on GMO in starch. For more background, please

see the background document for the Chemicals module which can be found on the Nordic Ecolabelling website.

O42 Organic fluorine compounds

Organic fluorine compounds must not be ingoing substances (see Definitions) in chemicals used in the production of pulp and/or paper.

- A declaration from the manufacturer of pulp and paper that no chemicals containing organofluoride compounds have been added during production of the pulp or paper.

Background to requirement O42 organic fluorine compounds

Nordic Ecolabelling does not have any experience of paper as a material in furniture. However, we know that chemicals can be added to give paper desired characteristics. Organic fluorine compounds are used for many other purposes and are widely used to make products more water resistant. For example, they are used as agents for waterproofing textiles, footwear and food packaging. It is therefore not possible to rule out that such fluorine compounds may be added to the paper to give it such properties. It is known from other criteria that fluorinated substances may also be added during the production of pulp or paper.

Highly fluorinated compounds are persistent and have the ability to bioaccumulate. PFOS (perfluorooctane sulfonate) and PFOA (perfluorooctanoic acid) are the two fluorinated compounds that we know the most about today. They both have serious effects on human health and the environment. Long-chain perfluorocarboxylic acids (C9-PFCA – C14-PFCA) are another type of fluorinated substances that are also persistent, with high potential for bioaccumulation. Knowledge of short-chain perfluorinated compounds has increased, and several of these have been suspected of being as harmful as the long-chain compounds they replace.[50] PFBS is a fluorine compound with a short carbon chain (C4) recently adopted to be listed on the Candidate List.[51]

5.6.3 Surface treatment and additives in paper

O43 Antibacterial substances

Chemical products and nanomaterials* with antibacterial or disinfectant properties must not be added to the finished paper or used in surface treatment of the paper.

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

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

[50] Danish Ministry of the Environment, 2015: Short-chain polyfluoroalkyl substances (PFAS), A literature review of information on human health effects and environmental fate and effect aspects of short-chain PFAS, Environmental project No. 1707, 2015

[51] https://www.miljodirektoratet.no/aktuelt/nyheter/2020/januar-2020/eu-stempler-nytt-perfluorert-stoff-som-miljogift/ (available February 5, 2020)

- A declaration from the manufacturer of the paper showing that no chemical products and nanomaterial with antibacterial or disinfectant properties have been added to the paper or used as a surface treatment.

Background to requirement O43 antibacterial substances

See background to O17.

O44 Classification of chemical products

Chemical products used as surface treatment or added to the finished paper must not contain any of the classifications in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372

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

Note that responsibility for correct classification lies with the manufacturer.

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

O45 Classification of ingoing substances

Ingoing substances (See Definitions) in the chemical products used as surface treatment or added to the finished paper must not contain any of the classifications in the table below:

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemption is given for titanium dioxide (CAS No. 13463–67–7) classified H351.

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

O46 Prohibited substances

The following substances shall not be an ingoing substance (See Definitions) in chemical products:

- Substances on the Candidate List*
- Substances that have been evaluated in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)**
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
  - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
  - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
  - List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called "Substances no longer on list" and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn't 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 on sub list II.

- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
  - Bronopol (CAS No. 52–51–7) may be present in the chemical product at a level of not more than 0.05% by weight

- Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one CAS No. 247–500–7; 2-methyl-4-isothiazolin-3-one CAS No. 220–239–6) may be present in the chemical product at a level of not more than 0.0015% by weight
- IPBC (Iodopropynyl butylcarbamate) may be present in the chemical product at a level of not more than 0.20% by weight.
- Halogenated organic pigments that comply with the Council of Europe recommendation "Resolution AP (89) 1 on the use of colorants in plastic materials coming into contact with food", point 2.5.

**** Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Isothiazolinones may be present in the chemical product at a level of not more than 0.05% by weight
- Butylhydroxytoluene (BHT, CAS No. 128–37–0)
- Aziridine and polyaziridines
- Bisphenol A, S and F
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates****
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

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

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

O47 Nanomaterials

The chemical product used as surface treatment or added to the finished paper must not have nanomaterials* as ingoing substances (See Definitions).

- Pigments**
- Naturally occurring inorganic fillers***
- Unmodified synthetic amorphous silica

** see definitions.*

*** This exception does not include pigments added for purposes other than colour.*
**** This applies to fillers covered by Annex V item 7 of REACH*

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

Background to requirements O45–O49

See requirements O17–O21.

5.7 Laminate

The requirements in this chapter cover different types of laminate, such as direct pressure laminate (melamine), High Pressure Laminate (HPL), Continuous Pressure Laminate (CPL) and compact laminate. The requirements apply only to the laminate itself, i.e. if a wood-based panel is used as a substrate, the panel must meet the requirements in Chapter 5.5. Melamine can alternative also be declared in Chapter 5.5 when already attached to a panel.

Adhesives used to secure the laminate to the substrate must meet the requirements in Chapter 5.3.1 Any surface treatment must meet the requirements in Chapter 5.7.3 and edgings of plastic must meet the requirements in Chapter 5.9.

The criteria for chemicals apply to all chemical products used for the manufacture of laminate, for example, resins. However, the criteria do not apply to chemical products used for the manufacture of paper and for printing patterns on decor paper.

Small parts of laminate such as lists are excluded and do not have to meet the requirements of this chapter except for O49 Antibacterial substances.

O48 Nordic Swan Ecolabelled laminate

If the laminate is Nordic Swan Ecolabelled in accordance with the Nordic Swan Ecolabel criteria for Construction and facade panels, generation 6 or later, the requirements in this chapter are fulfilled. However, all other chapters must still be fulfilled.

- Name, manufacturer and licence number for the laminate.

O49 Antibacterial substances

Chemical products and nanomaterials* with antibacterial or disinfectant properties must not be added to the laminate.

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

** See definitions.*

- A declaration from the manufacturer of the laminate showing that no chemical products and nanomaterials with antibacterial or disinfectant properties have been added to the laminate.

Background to requirement O49 antibacterial substances

The requirement is new. A requirement is also made that the finished item of furniture must not contain nanoparticles and antibacterial substances. A declaration of compliance with this is required from the furniture manufacturer. To ensure that the laminate manufacturer does not use these substances, the requirement is made here too. Laminate worktops for kitchens and bathrooms can be given an antibacterial finish and are marketed as more hygienic.

O50 Classification of chemical products

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

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372

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

Note that responsibility for correct classification lies with the manufacturer.

Exemptions apply to:

- The classifications H341, H301 and H331 for resins containing a maximum of 10% by weight of phenol (CAS No. 108–95–2).
- The classifications H350, H341, H301, H311 and H331 for resins containing formaldehyde (CAS No. 50–00–0). Emissions of formaldehyde from the laminate are regulated in a separate requirement.
- The classifications H301, H311, H331 and H370 for resins containing a maximum of 10% by weight of methanol (CAS No. 67–56–1).
- The classifications H351 and H361 for resins containing melamine (CAS No. 108–78–1).
- The classification H411 for UV-curing products under the following conditions: There must be a controlled closed process where no discharge to drains takes place. Spills and residual waste (e.g., residues from cleaning) must be collected in containers approved for hazardous waste and handled by a waste contractor.

T̄ A declaration from the manufacturer or supplier of the chemical products that are used for the manufacture of laminate.

T̄ Safety data sheet for each chemical product used for the manufacture of laminate in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

- Exemption for UV-curing products: Description of the process and how waste and residual waste are handled, including information on who receives the residual waste

Background to requirement O50 Classification of chemical products

It is desirable to set requirements for the chemicals used in the manufacture of laminate, since many chemicals are used and some of them have hazardous properties in their unhardened state. The requirements apply to all chemicals used in the manufacture of laminate. However, the requirements do not apply to chemicals used in the manufacture of paper and to dye or print patterns on decor paper. This production takes place too far off in the supply chain and the steerability for setting requirements is low.

Resins containing phenol, formaldehyde and methanol are used in the production of several types of laminates to waterproof the paper. Since it is not possible to produce laminate without these resins, exemptions are made for these substances. A maximum of 10% by weight of phenol and methanol respectively is permitted in the resins. This threshold limit value is taken from Version 6 of the criteria for Construction and facade panels. To ensure that the resins have hardened properly, a subsequent requirement is made concerning emissions from the laminate in its finished form. In June 2021, an exemption was also introduced for UV-curing products used to impregnate the upper paper layer. UV curing technique is commonly used in e.g., surface treatment of furniture to get a surface with good durability and quality while containing low VOC levels. Exemptions are therefore granted for UV-curing products in surface treatment. As UV-curing products can also be used in the production of the laminate itself, an exemption has been introduced for UV-curing products here as well.

On 28 June 2022 Nordic Ecolabelling decided to make an exemption for the classification prohibitions H351 and H361 for resins with melamine. The exemption is made since melamine has started to be self-classified as H361 (Repr. 2) by several suppliers.

In the end of 2020, the Committee for Risk Assessment (RAC) at ECHA also decided that melamine should get the harmonized classifications H351 (Carc. 2) and H373 (STOT RE 2). These harmonized classifications are obligatory from 23 November 2023. The classification H361 will not be a harmonized classification, but it could be producers who uses this self-classification in addition to the harmonized classifications. Nordic Ecolabelling gives exemptions both for the self-classification and the new harmonized classifications since there are today no chemical substance that could substitute melamine.

O51 Classification of ingoing substances

Ingoing substances (See Definitions) in the chemical product used in the manufacturing of laminate must not have any of the classifications in the table below:

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemption applies to:

- The classifications H350 and H341 for resins containing formaldehyde (CAS No. 50–00–0). Emissions of formaldehyde are regulated in a separate requirement.
- The classification H341 for resins containing a maximum of 10% by weight of phenol (CAS No. 108–95–2).
- The classifications H351 and H361 for resins containing melamine (CAS No. 108–78–1).
- The classification H351 for titanium dioxide (CAS No. 13463–67–7).
- The classification H361 for 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6).

t̄ A declaration from the manufacturer or supplier of the chemical products that are used for the manufacture of laminate.

t̄ Safety data sheet for each chemical product used for the manufacture of laminate in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

Background to requirement O51 ingoing substances

The requirement was added to the laminate chapter to make it clear that the requirement must be met. For background details, see the general chemical requirements in Chapter 5.3. In this requirement too, there is a need for an exemption for formaldehyde, phenol and melamine that is used in resins. A subsequent requirement is made concerning emissions of formaldehyde from the laminate in its finished form.

O52 Prohibited substances

The following substances must not be an ingoing substance (See Definitions) in chemical products used in the manufacturing of the laminate:

- Substances on the Candidate List*
- Substances that have been evaluated in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)**
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:

- List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
- List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
- List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn't 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 on sub list II.

- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
  - Bronopol (CAS No. 52–51–7) may be present in the chemical product at a level of not more than 0.05% by weight
  - Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one CAS No. 247–500–7; 2-methyl-4-isothiazolin-3-one CAS No. 220–239–6) may be present in the chemical product at a level of not more than 0.0015% by weight
  - IPBC (Iodopropynyl butylcarbamate) may be present in the chemical product at a level of not more than 0.20% by weight.

*** *Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Isothiazolinones may be present in the chemical product at a level of not more than 0.05% by weight
- Butylhydroxytoluene (BHT, CAS No. 128–37–0)
- Aziridine and polyaziridines
- Bisphenol A, S and F
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates****
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

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

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

Background to requirements O52 prohibited substances

See requirement O20.

O53 Nanomaterials

The chemical product must not have nanomaterials* as ingoing substances (See Definitions). Exemptions apply to:

- Pigments**
- Naturally occurring inorganic fillers***
- Unmodified synthetic amorphous silica

** See definitions.*

*** This exception does not include pigments added for purposes other than colour.*
**** This applies to fillers covered by Annex V item 7 of REACH*

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

Background to requirement O53 nanomaterials

See requirements O21.

O54 Requirements for emissions

Laminate must comply with the requirements for emissions in the table below. The test must be performed in compliance with EN 16516.

Substances or groups of substances	Threshold limit values after 28 days* (µg/m^3)
TVOC (C6–C16)	160
SVOC (C16–C23)	30
Formaldehyde	30

** If the limit values in the table can be reached in a shorter time than 28 days, this is also accepted.*

Alternatively, compliance with only the requirement for emissions of formaldehyde can be chosen for direct pressure laminate (melamine). It is the finished coated panel material that must be tested and one of the following limit values must be met:

a) The emission of formaldehyde must on average not exceed 0.062 mg/m3 air according to test method EN 717–1.

b) The emission of formaldehyde must on average not exceed 0.124 mg/m3 air according to test method EN 16516.

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

Background to requirements O54 emissions

The requirement has been taken from the product group Construction and facade panels, Version 6, where HPL panels and melamine-coated panels can be Nordic Swan Ecolabelled. It is considered relevant to set requirements for emissions to ensure that the resin used to manufacture the laminate has properly hardened.

There are requirements for the amount of VOCs in adhesives for wood-based panels, and for the amount of VOCs in the products that are used or the amount of VOCs applied in the surface treatment of wood-based materials. For laminate there are no requirements to the content of VOC in the chemical products used in the manufacture of laminate. Therefore, this requirement also includes limit values for emissions of TVOC and SVOC.

For direct pressure laminate (melamine), there is the option of meeting the formaldehyde emission requirements using a test in compliance with EN 717–1 or EN 16516. Usually, the same manufacturer will make the carrier substrate material, in the form of chipboard or MDF, and impregnate the paper with resin. The manufacturer then laminates the impregnated paper on the panel at the factory using heat and pressure. It is thus not possible to just test the laminate emissions. It is the panel as a finished product that is tested. It is normal to use just one layer of paper when manufacturing direct pressure laminate. This means that it contains less resin than other types of laminate. It is thus sufficient that direct pressure laminate shows compliance with the formaldehyde emissions requirements.

5.7.1 Requirement when laminates make up more than 10% by weight of the furniture/fitment

O55 Energy consumption in the manufacture of laminate

No more than 14 MJ/kg per panel may be used for the manufacture of the laminate.
The energy consumption must be stated as an annual average and can either be stated for the manufacture of the laminate that must be included in the Nordic Swan Ecolabelled furniture/fitment, or for the entire production.

Energy for the production of raw materials must not be included in the calculation. Paper has a separate energy requirement.

Internally produced energy and excess energy that are sold off must be stated but must not be included as consumed energy in the calculation.

For detailed information on how the energy calculation is to be done, see Appendix 2.

t̄ Calculation of energy consumption from the laminate manufacturer.

Background to requirement O55 laminate more than 10% by weight of the furniture/fitment

The requirement was also included in Version 4 of the criteria and the requirement level is unchanged. Previously, there were two requirement levels depending on the thickness of the laminate. One of the requirement levels has been removed because the requirement only has to be met if the content of laminate in the finished item of furniture is more than 10% by weight.

This is the same as the requirement in Version 6 of Construction and facade panels. The requirement's threshold limit value for thicker laminates is still considered to be strict and has therefore not been changed.

5.7.2 Requirement when laminates make up more than 30% by weight of the furniture/fitment

The requirements for paper in this section only apply to kraft paper. It is not necessary for decor paper and any balance paper to meet the requirements.

Nordic Ecolabelling has produced a calculation sheet for requirement O61 (Energy). This can be used to calculate and document the requirement. Pulp that has been inspected in accordance with the Nordic Swan Ecolabel Base Module for paper automatically meets the requirements for pulp in this section. However, it must be shown that the cumulative pulp and paper production also meets the requirements.

O56 Tree species with restricted use

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

a) CITES (Appendices I, II and III)

b) IUCN red list, categorized as CR, EN and VU

c) Rainforest Foundation Norway´s tree list

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

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

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

- the tree species does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU.
- the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 http://www.intactforests.org/world.map.html.
- the tree species must originate from FSC or PEFC certified forest/plantation and must 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 not originate from plantations established on areas converted from forest after 1994.

**The list of restricted tree species is located on the website: https://www.nordic-swan-ecolabel.org/pulp-paper-declaration-portal/what-can-be-declared/forestry-requirements/*

- Declaration from the applicant/manufacturer/supplier that tree species listed on a-d) are not used.

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

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

- The applicant/manufacturer/supplier are required to document full traceability back to the forest/certified forest unit thereby demonstrating that;
  - the tree does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU;
  - the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 https://intactforests.org/world.webmap.html
  - for plantations, the applicant/manufacturer/supplier must document that the tree species does not originate from plantations established on areas converted from forest after 1994.

Background to requirement O56 tree with restricted use

See background to O25.

O57 Wood fibre in paper

Where paper is used in the manufacture of laminate, the following requirements must be met:

- The names of the species of trees used to produce the paper must be stated. Species of trees on the Nordic Swan Ecolabel's list of prohibited tree species* (https://www.nordic-swan-ecolabel.org/pulp-paper-declaration-portal/what-can-be-declared/forestry-requirements/) must not be used. The requirement applies to new fibres only and not to recycled fibres*.
- The paper producers must be Chain of Custody certified by the FSC scheme or the PEFC scheme.
- Compliance with one of the following three alternatives is required, on an annual basis, for certified wood fibre and/or recycled fibres:

a) 70% of the fibre raw material in the paper must be certified by the FSC or the PEFC scheme.

b) The paper must be labelled FSC or PEFC Recycled. Alternatively, 70% of the fibre raw material must consist of recycled fibres.

c) If less than 70% of the fibre raw material content in the paper is recycled fibre, the percentage of fibre raw material that must be sourced from certified forests is calculated using the following formula:

$$Y\ (\%) \geq 70 - x$$

Y = Percentage of fibre raw material from certified forests
x = Percentage of recycled fibre

**Recycled material defined as pre-consumer and post-consumer in accordance with ISO 14021. See detailed information in Definitions.*

- Information about names of the tree species used.
- Valid FSC/PEFC Chain of Custody certificate/link to certificate holder's valid certificate information in FSC/PEFC certificate database from the producer/supplier of paper. Manufacturers that only use recycled materials are exempt from this requirement.

- Certified wood fibre option a): An invoice between the paper manufacturer and laminate manufacturer showing the purchase of FSC/PEFC certified paper.
- Certified wood fibre option b): An invoice between the paper manufacturer and laminate manufacturer showing the purchase of FSC or PEFC Recycled labelled paper. Or a declaration of compliance with the requirement for recycled fibre content from the paper manufacturer. Recycled fibres not covered by FSC/PEFC chain of custody certificates must be covered by delivery notes of paper for recycling in accordance with EN 643.
- Certified wood fibre option c): Paper manufacturer's calculation of the percentage of fibre raw material that is FSC/PEFC certified and recycled, and documentation showing that paper with the certified amount is purchased. This should be specified in e.g. invoices or delivery note.

Background to requirment O57 wood fibre in paper

The threshold limit value has been raised to 30% by weight of the finished furniture. This was 10% by weight in the previous version of the criteria. In practice, this means that the requirement only must be met for compact laminate which is made of compact layers of impregnated paper. The reason why only compact laminate needs to meet the paper requirements is that the requirements must be documented far back in the supply chain and are most relevant when the laminate is composed of a large amount of paper.

Kraft paper and decorative paper are used to manufacture compact laminate. Only the uppermost layer is made of decorative paper. Since it therefore accounts for a very small percentage of the panel it does not need to meet the requirements for paper. A sheet of balance paper can be used if only one side of a panel is laminated. This balance paper does not need to meet the requirements.
Kraft paper must meet the requirement, and it is relevant to have a requirement for the wood fibre to ensure that it comes from sustainably managed forests or is recycled fibre. Recycled fibre is environmentally beneficial as it saves virgin raw materials. Moreover, producing paper from new fibres consumes more energy than producing it from recycled fibres.

O58 Emissions of COD from paper and pulp production

The total discharge of COD (chemical oxygen demand) to water must be less than the COD value in the table below.
COD is calculated by adding COD emissions from the pulp and paper:

COD pulp (kg/ADt) + COD emissions from the paper machines (kg/ADt).

For paper produced from mixes of chemical pulp, recycled fibres and mechanical pulp, a weighted reference value of the different types of pulp is calculated. In the weighted calculation, the proportion of COD emissions from the paper machine must be set to 1 kg / ADT. For example, with 60% unbleached chemical mass and 40% return mass, the calculation is: (14-1 x 0.6) + (4-1 x 0.4) = 7.8 + 1.2 = 9.0 kg / ADT.

Types of pulp	Total emission of COD for both pulp and paper (kg/ADt)
Unbleached chemical pulp	14.0
CTMP pulp	19.0
TMP/Groundwood pulp	7.0
Recycled fibre pulp	4.0

- Information about the types of pulp used for the manufacture of paper.
- If pulp that is inspected in accordance with the Nordic Swan Ecolabelled basic module for paper is used: Description of manufacturer, production facility and name of the pulp.
- Description of test procedures including measuring methods and measuring results for the last 12 months from the paper and pulp manufacturers.
- Calculation from the paper and pulp manufacturers showing that the total emission of COD is below the relevant threshold limit value in the requirement.

Background to requirement O58 emissions of COD pulp and paper

All pulp and paper production generate wastewater with organic content expressed as chemical oxygen demand (COD). Microorganisms consume oxygen to break down the organic matter. This may lead to low oxygen concentrations in the water and, in some cases, anaerobic conditions. The Nordic Swan Ecolabel's basic module for paper also contains requirements concerning other emissions, such as emissions of nitrogen and phosphorus. However, requirements are only set for COD. COD emissions also correlate with other emissions. If the emission of COD is low, emissions of other substances to water are thus also expected to be low.

O59 Energy consumption in paper and pulp production

The following requirements must be met:

$P_{electricity(total)} < 2.5$

$P_{fuel(total)} < 2.5$

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

P is the energy score for the paper and pulp production. The energy score from both the production of paper and the pulps are included in $P_{electricity(total)}$ and $P_{fuel(total)}$. A more detailed explanation of the calculation is given in Annex 3.

- If pulp that is inspected in accordance with the Nordic Swan Ecolabelled basic module for paper is used: Description of manufacturer, production facility and name of the pulp.
- A calculation from the paper and pulp manufacturers showing compliance with the limit values for the score. Please note that there has been developed a calculation sheet for the energy calculations that can be obtained by Nordic Ecolabelling.

Background to requirement O59 Energy consumption in pulp and paper

The requirement was also included in Version 4 of the criteria but has been changed to harmonise with the requirement proposed in Nordic Swan Ecolabel's revised basic module

for paper Version 3. The calculation in the revised basic module has been reworked, resulting in a change to the requirement level for the total energy score. Details of this can be found in the basic module's background document.

The requirement must be met for compact laminate which consists largely of kraft paper, and where the manufacture of paper accounts for a substantial amount of the energy used in the production of the laminate. It is therefore relevant to set energy consumption requirements for both paper and pulp. A reference value for kraft paper production that is to be used for the calculation was defined when Construction and facade panels Version 6 was revised. This reference value has not been changed, and further details are given in Annex 3.

5.7.3 Surface treatment of wood, wood-based panels and laminate

The requirements in this section relate to surface treatment of wood, bamboo, wood-based panels and laminate.

O60 Antibacterial substances

Chemical products and nanomaterials* with antibacterial or disinfectant properties must not be used in surface treatment.

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

** See definitions.*

† A declaration from the manufacturer of the chemical products that are used in the surface treatment/surface treatment system.

Background to requirement O60 surface treatment of wood, wood-based panels and laminate

The requirement is new because there were no requirements for antibacterial substances for surface treatment products in Version 4 of the criteria. Since Nordic Ecolabelling wants to take a restrictive approach to nanoparticles and antibacterial substances, it is relevant to make the requirement for surface treatment products too.

O61 Classification of chemical products

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

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341

Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372

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

Note that responsibility for correct classification lies with the manufacturer.

*Exemption applies to UV curing surface treatment products classified as environmentally hazardous if requirement O64 is met.

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

Background to requirement O61 classification of chemical products

The requirement is changed, as the minimum threshold for when the requirements for surface treatment must be met is changed and the classification H334 (respiratory sensitisation) have been added. Previously, all requirements applied only if the parts that had been surface treated made up more than 5% by weight of the finished furniture. This has been changed. The chemical requirements must now be met irrespective of the percentage of the surface treated parts in the furniture, and the requirements for the amount of hazardous substances and VOCs applied in the surface treatment must be met when the parts account for more than 5% by weight. Nordic Ecolabelling normally sets requirements for chemicals irrespective of the quantities used, which is why the minimum threshold has been changed.

The classification H334 has been added to the requirement after consultation. By adding this classification to the requirement, the Nordic Swan Ecolabel can be used as a verification for Upphandlingsmyndighetens (public procurement in Sweden) requirements without additional information being required.

Exemption is made for UV curing surface treatment products that are classified as environmentally hazardous. UV products have several advantages as they provide a durable surface and contain a low amount of solvents. Later requirements are placed on the amount of VOC applied, which promotes water-based UV products.

UV products contain acrylates, and more and more acrylates are classified as environmentally hazardous or receive stricter classifications. Acrylates and photo initiators are two important components for UV products to cure. The acrylates change properties in the hardening and bind to the surface coating, so they do not pose an environmental hazard

in the finished furniture. To make demands on e.g. the maximum amount of environmentally hazardous substances applied means that only UV products with a lower concentration of acrylates would meet the requirement. This has negative consequences as it leads to longer curing time and more energy-intensive curing. A surface that has not hardened becomes less resistant, which makes the Nordic Ecolabel's requirements for wear resistance of surfaces difficult to meet.

O62 UV curing surface treatment system

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

- Description of the process and how waste and residual waste are handled, including information about who receives the wastes.

Background to requirement O62 UV curing surface treatment system

There is an exemption for UV curing products in the requirement above that limits the use of chemical products classified as environmentally hazardous. UV curing products are often classified as environmentally hazardous due to the content of acrylates. The acrylates change properties in the hardening and bind to the surface coating, so they do not pose an environmental hazard in the finished furniture. Instead, it is important that no emissions of uncured product that have the environmentally hazardous properties occur. Requirements are therefore set for the application, which must take place during a controlled closed process where no discharges to recipient take place.

O63 Classification of ingoing substances

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

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemptions apply to:

- The classification H351, H341 or H361 for photo initiators.
- The classification H351 for titanium dioxide (CAS No. 13463–67–7).
- The classification H361 for 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6).

- The classification H351 for trimethylolpropane triacrylate (TMPTA, CAS No. 15625–89–5).
- The classification H361 for mequinol (CAS No. 150–76–5).
- The hardener in 2-component UV products can be exempted from the requirement if the following is met: it must be documented that the workers are not exposed to the components, e.g. by using safety equipment when mixing or that the mixing takes place automatically without exposure of the workers and that the application of the finished two-component system is done in a closed system.

- Safety data sheet for each chemical product used in the surface treatment/surface treatment system in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).
- A declaration from the manufacturer of the chemical product(s) used in the surface treatment.
- Exemption for two-component products: description of the application system and how workers are protected from exposure.

Background to requirement O63 classification of ingoing substances

An exemption applies to photo initiators. They may be present in UV products. They are present in small amounts but are necessary to speed up the hardening process.

Exemptions have also been added for titanium dioxide (CAS No. 13463–67–7), 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6), (TMPTA, CAS No. 15625–89–5) and mequinol (CAS No. 150–76–5). Titanium dioxide is a white pigment that is used in many different types of products, including being used in almost all pigmented surface treatments. 1,1,1-Trimethylolpropane (TMP) is used to coat titanium dioxide to make the titanium dioxide particles easier to disperse. About 90% of all titanium dioxide is coated with TMP. Mequinol is used as a diluent in binders for UV surface treatments. Trimethylolpropane triacrylate (TMPTA, CAS No. 15625–89–5) have been reclassified as class 2 carcinogen H351.

All three substances are necessary for use in surface treatment products and have recently been classified as CMR category 2, either as a harmonized classification or self-classification. There are currently no good substitutes and exemptions have therefore been given. Exemptions have also been introduced for the hardener in 2-component UV products if it can be documented that workers are not exposed, and the application takes place in closed systems. After curing, the hardener no longer has these properties. Nordic Ecolabelling generally wants to limit the use of chemicals with these properties as much as possible, but in some cases, it is difficult to find good substitutes. As these are industrial processes that take place under controlled conditions, the consumer will not be exposed to these substances.

O64 Prohibited substances

The following substances must not be an ingoing substance (see Definitions) in chemical products:

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

- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
    - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
    - List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn't 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 on sub list II.

- Perfluorinated and polypluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
    - Bronopol (CAS No. 52–51–7) may be present in the chemical product at a level of not more than 0.05% by weight
    - Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one CAS No. 247–500–7; 2-methyl-4-isothiazolin-3-one CAS No. 220–239–6) may be present in the chemical product at a level of not more than 0.0015% by weight
    - IPBC (Iodopropynyl butylcarbamate) may be present in the chemical product at a level of not more than 0.20% by weight.
    - Halogenated organic pigments that comply with the Council of Europe recommendation "Resolution AP (89) 1 on the use of colorants in plastic materials coming into contact with food", point 2.5.

*** *Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Isothiazolinones may be present in the chemical product at a level of not more than 0.05% by weight
- Butylhydroxytoluene (BHT, CAS No. 128–37–0)
    - An exemption is given for BHT inUV curing lacquers and paints. If BHT is given a harmonized official classification so that the substance does not meet the requirements of the criteria document, the exemption will no longer be valid.
- Aziridine and polyaziridines****
- Bisphenol A*****, S and F
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates******
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

***** Exemption is given for aziridine/polyaziridine if the substance is not classified as carcinogenic, mutagenic or toxic for reproduction from any manufacturer or in ECHA.*

******Bisphenol A used in the production of epoxy acrylate is not covered by the requirement.*

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

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

Background to requirements O64 prohibited substances

See requirement O20.

O65 Nanomaterials

The chemical product used for surface treatment must not contain nanomaterials* as ingoing substances (see Definitions). Exemptions are made for:

- Pigments**
- Naturally occurring inorganic fillers***
- Unmodified synthetic amorphous silica

** See definitions.*
*** This exception does not include pigments added for purposes other than colour.*
**** This applies to fillers covered by Annex V item 7 of REACH*

- A declaration from the chemical manufacturer that the chemical product does not have nanomaterial as ingoing substance.

Background to requirement O65 Nanomaterials

See requirements O21.

O66 Free formaldehyde

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

- A declaration from the manufactures of the chemical products in the surface treatment system.

Background to requirement O66 free formaldehyde

See requirement O23.

5.7.4 Requirement is surface coated parts make up more than 5% by weight of the furniture/fitment

O67 Quantity applied and application method

For each surface treatment system used, the furniture manufacturer must provide the following information:

a) Name of the surface treatment product and its manufacturer

b) Quantity applied (g/m2), number of coats and application method(s) used.

The following efficiency* levels must be used when calculating the quantities of applied environmentally hazardous substances and VOCs in subsequent requirements:

- Automated spray with no recycling, 50%
- Automated spray with recycling, 70%
- Spray application, electrostatic, 65%
- Spray application, bell/disk, 80%
- Roller varnishing 95%
- Blanket varnishing 95%
- Vacuum varnishing 95%
- Dipping 95%
- Rinsing 95%

**The levels of efficiency are standard values. Other efficiency levels may be applied if they can be documented.*

t̄ A description from the furniture manufacturer of each surface treatment system that is used.

Background to requirement 067 quantity applied and application method

It has been made more explicit that the furniture manufacturer must also state the name and manufacturer of the chemical products that are used in each surface treatment system. Information about applied quantities, number of coats and method of application was also a requirement in the previous version of the criteria. This information is required to calculate applied quantities of environmentally hazardous substances and VOCs in subsequent requirements.

O68 Quantity of applied volatile organic compounds (VOC)

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

a) The total content of VOCs* must not exceed 5% by weight

b) The total amount of VOCs applied must not exceed the relevant threshold limit value in the table below:

Type of furniture	Threshold limit value for VOC applied (g/m^2 coated surface)
Furniture coated with laminate	10
Furniture and interior doors intended for domestic use	30
Furniture and interior doors intended for non-domestic use	60
Kitchen and bathroom fitments	60

The applied quantity of VOCs according to alternative b) is calculated using the following formula:

$$\frac{\text{Applied amount of the surface treatment chemical } \left(\frac{g}{m^2}\right) x \text{ share of VOC in the surface treatment chemical } (\%)}{\text{Efficiency of the surface treatment } (\%)}$$

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

c) VOC emissions from the finished furniture must meet the limit value in the table below. Test conditions are also given in the table. Packaging and delivery of samples sent for analysis, handling and processing of these, climate chamber requirements and methods for gas analysis must follow the procedures described in the ISO 16000 standard series or equivalent test methods.

Chamber volume	Between 2 and 10 m^3
Loading rate	0,5–1,5 m^2/m^3
Ventilation rate	0,5–1,5 t-1
VOC (28 days)	≤450 µg/m^3

**Volatile organic compounds (VOCs) are defined as compounds with a boiling point of <250°C at 101.3 kPa (1 atm).*

- Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for each chemical product in the surface treatment system.
- A declaration from the manufacturers of the chemical products in the surface treatment system stating the quantities of VOCs in each product.
- A calculation from the furniture manufacturer showing that alternative b) in the requirement is met if the surface treatment system does not meet alternative a).
- Test report from chamber test according to ISO16000. If the test result is obtained before 28 days, the requirement is considered fulfilled.

Background to requirement O68 quantity of applied VOC

The reason for this requirement is that VOCs contribute to the formation of ozone and can have adverse health effects in the workplace and indoor climates. Nordic Ecolabelling has decided not to introduce requirements for the testing of VOC emissions from furniture as a

finished product, since such tests are expensive and time-consuming, especially for small-scale furniture makers. With a strict requirement for the amount of VOCs in the surface treatment products or the applied amount of VOCs, the emissions from the furniture are expected to be low. If a test has been made of VOC emissions from the finished furniture, this can also be a way of documenting the requirement. The requirement limit for VOC emissions from the finished furniture is similar to the limit set in EU Ecolabel's criteria for furniture.

The threshold limit values under this requirement have not been changed. However, changes have been made for which types of furniture must meet which threshold limit values. There was a requirement in Version 4 of the criteria that bedroom furniture and living room furniture must meet the threshold limit value of 10 g/m^2. This has proved problematic when processing an application because normally an item of furniture can be used in several different rooms and it has been unclear which threshold limit value must be met. The requirement has therefore been changed so that furniture intended for domestic use must meet the 30 g/m^2 requirement. This is the threshold limit value most often used when processing an application and it is considered to be strict. It was also stated in Version 4 of the criteria that the requirement for doors was 10 g/m^2. This threshold limit value has proved too strict to achieve good quality. The threshold limit value has therefore been changed to 30 g/m^2 for doors intended for domestic use and 60 g/m^2 for doors intended for non-domestic use. The requirement threshold of 10 g/m^2 is unchanged for furniture coated with laminate. It is not necessary to surface treat these and if they are treated, they do not require as much coating to achieve a durable finish.

There was also a paragraph in Version 4 of the criteria saying that high-quality furniture must meet the higher threshold limit value of 60 g/m^2. High-quality furniture was considered those which in subsequent requirements for surface strength and durability are at level 5 or above. Level 5 is only relevant for tabletops and worktops and no other types of furniture. All surface treated furniture must meet the relevant requirement level for surface strength and the paragraph about high-quality furniture has therefore been deleted. The furniture that must meet the higher threshold limit value of 60 g/m^2 is furniture intended for use in office or public spaces and in kitchens and bathrooms. The reason for the higher threshold limit value is that these types of fitments can expect more wear and tear and need a higher-quality surface finish for a longer-lasting result.

5.8 Metal – Steel and aluminium

Requirements apply to surface treatment and production of steel and aluminium. The chemical requirements only apply to the chemical products used for the surface treatment and not constituent substances, such as alloying metals, in the metal.

Production requirements for steel and aluminium apply if the metals are included in the product with more than 30% by weight and 10% by weight, respectively. Small parts such as screws, bolts, plugs, fittings, buttons, zippers and so on are excluded from weighing and should not be included in the weight calculation.

Small parts consisting of metal and weighing less than 100 grams are also exempt from all requirements in this chapter except requirement O69.

The requirements of this chapter do not apply to metal that is part of electric or electronic components.

O69 Copper, tin, lead and cadmium

The metals copper, tin, lead, and cadmium are prohibited. This also applies to any surface coating.

- A declaration from the supplier of the surface coating stating that these substances are not used.

Background to requirement O69 copper, tin, lead and cadmium

The requirement is set because these substances cause problems during metal recycling[52].

5.8.1 Surface treatment and metallisation

Metal coating, such as metallisation, powder coating and any other surface treatment must meet the following requirements.

- Coatings with metals (metallisation) must comply with O70
- Other surface treatment must comply with O71–O77.

O70 Chrome, nickel, and zinc plating

Surface treatment with chromium (Cr), nickel (Ni), zinc (Zn) and their compounds is only permitted for the following furniture parts and under the following conditions:

- Screws, bolts, mechanisms where it is necessary due to excessive physical wear/load, such as drawers.
- Legs on folding tables, chair legs and legs on tables/desks that comply with the requirements of standards for educational institutions (EN 1729–1, EN 1729–2).
- Legs on folding tables and chair legs that meet standards for tables and chairs for public spaces (EN 16139, EN 1728, EN 1022).
- Nickel: The exemption does not apply to parts that frequently come into contact with the skin.

It should be noted that the above exemptions only apply to the types of furniture covered by the standards. The exemption cannot be used for office chairs and other typical office furniture that are covered by standards for office environments.

The following requirement applies when chromium (Cr), nickel (Ni), zinc (Zn) is used in the surface treatment:

- All stages of the process using chromium must be based on trivalent chromium. Hexavalent chromium must not be used.
- The facilities must have a closed-loop wastewater system*. Residual products from the surface treatment are to be handled at a facility that is licensed and authorised to handle hazardous waste.
- The following applies to zinc electroplating:
    - Cyanide baths must not be used

[52] EU-27 Steel Scrap Specification, May 2007: https://www.euric-aisbl.eu/facts-figures/standards-specifications

- The passivation process must be cobalt-free

* *A closed-loop wastewater system means that effluent is not discharged to municipal wastewater treatment plants or recipient.*

- A description from the furniture manufacturer of which parts are coated with chromium, nickel or zinc.
- A declaration from the supplier of the surface coating that hexavalent chromium has not been used.
- For zinc: A declaration from the supplier of the surface coating that cyanide baths have not been used, and that the passivation process is cobalt-free.
- Name of the waste management facility handling the waste products.

Background for requirement O70 chrome, nickel and zink plating

As before, the use of chromium, nickel and zinc for coating is permitted for some parts and for some types of furniture that are subject to great wear and tear. Metal coatings ensure good wear resistance and potentially extend the useful life. This is important from a circular economy perspective, and it may become even more important in the future as society places an increasing focus on reuse. For example, chairs can be reupholstered if the legs are still in good condition. It is important to point out that the useful life of an item of furniture depends on several factors and furniture is often replaced before it is worn out[53]. Nevertheless, Nordic Ecolabelling is of the opinion that good quality and good resistance to wear will offer the potential for a long useful life. Coating with chromium, nickel and zinc also has no significant impact on the ability to recycle metal.

However, coating with these metals has adverse effects on human health and the environment. The chemicals that are used have a number of classifications, e.g. Chromium VI is classified as H317, H400, H410 and H350. Chromium III does not have these effects[54]. Nickel plating salts e.g. NiCl2, are classified as H350, H341 and H360D. The substances in the finished coating are converted into pure metal layers that are not classified. However, nickel is known to cause allergies as small amounts of nickel are released from the coating upon contact with skin[55]. Emissions to water from facilities is also a relevant parameter.

Therefore, it is only allowed on small parts, such as screws, bolts and mechanisms that are subject to excessive wear, on chair legs and tables/desks for educational institutions and table legs and folding tables that comply with standards for public spaces. This means that it is not allowed on office chairs, for example, because there is more scope to design such furniture to withstand wear and tear, e.g. by using brushed steel on areas particularly subject to high wear.

The requirement has been changed and tightened so that all coating processes must be zero-emission processes. This was also required previously, except for zinc, but the requirement was not very clearly worded. A zero-emission process means that nothing can be discharged to a recipient or municipal wastewater treatment plant. The waste must be

[53] Bartlett, 2009. "Reuse of office furniture – incorporation into the 'Quick Wins' criteria: A study of the market potential for reused and remanufactured office furniture in the UK."
[54] http://www.syf.se/Filer/Guide_ytbeh_v0.pdf
[55] Shane Donatello, Hans Moons and Oliver Wolf, Revision of EU Ecolabel criteria for furniture products, final technical report, 2017

collected and sent to an authorised and approved collection facility for hazardous waste. Closed-loop wastewater systems consume more energy because the process water must be distilled/evaporated. Heat exchangers are usually installed to utilise this energy. All new or renovated systems are zero-emission and, according to the Swedish industry association, that will be BAT when the new BAT report is published. There are no major differences in the Nordic region to indicate that it will be problematic to comply with this according to the Swedish industry association.

5.8.2 Other surface treatment

O71 Classification of chemical products

The chemical products used to surface coat metals must not contain any of the classifications in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372
Respiratory sensitization	Resp. Sens 1, 1A or 1B	H334

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

Note that responsibility for correct classification lies with the manufacturer.

- Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for each chemical product in the surface treatment system.
- A declaration from the manufacturers of surface treatment products.

Background to requirement O71 classification of chemical product

The requirement remains unchanged except that the classification H334 (Allergenic, Respiratory sensitization) has been added. Background details are given in Chapter 5.3.

O72 Classification of ingoing substances

Ingoing substances (see Definitions) in the chemical product used for surface treatment must not have any of the classifications in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemptions apply to:

- The classification H351 for titanium dioxide (CAS No. 13463–67–7).
- The classification H361 for 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6).

Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for each chemical product in the surface treatment system.

A declaration from the manufacturers of surface treatment products.

Background to requirement O72 classification of ingoing substances

The requirement is the same as in generation 5 of the criteria. Exemptions have been added for titanium dioxide (CAS No. 13463–67–7) and 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6). Titanium dioxide is a white pigment that is used in many different types of products and are used in almost all pigmented surface treatments. 1,1,1-Trimethylolpropane (TMP) is used to coat titanium dioxide in order to make the titanium dioxide particles easier to disperse. About 90% of all titanium dioxide is coated with TMP. There are no good substitutes for titanium dioxide and TMP at present and exemptions have been made so that pigmented surface treatments can still be used.

O73 Prohibited substances

The following substances must not be an ingoing substance (See Definitions) in chemical products used for surface treatment:

- Substances on the Candidate List*
- Substances that have been evaluated in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)**
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
    - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption

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

A substance which is transferred to one of the corresponding sub lists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn't 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 on sub list II.

- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
  - Bronopol (CAS No. 52–51–7) may be present in the chemical product at a level of not more than 0.05% by weight
  - Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one CAS No. 247–500–7; 2-methyl-4-isothiazolin-3-one CAS No. 220–239–6) may be present in the chemical product at a level of not more than 0.0015% by weight
  - IPBC (Iodopropynyl butylcarbamate) may be present in the chemical product at a level of not more than 0.20% by weight.
  - Halogenated organic pigments that comply with the Council of Europe recommendation "Resolution AP (89) 1 on the use of colorants in plastic materials coming into contact with food", point 2.5.

*** *Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Isothiazolinones may be present in the chemical product at a level of not more than 0.05% by weight
- Butylhydroxytoluene (BHT, CAS No. 128–37–0)
- Aziridine and polyaziridines
- Bisphenol A****, S and F
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates*****
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

**** *Exemption is given for bisphenol A as a residual monomer in powder coating.*

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

- A declaration from the manufacturer/supplier of the chemical product used for surface treatment.

- A safety data sheet for the product used for surface treatment in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006.

Background to requirement O73 prohibited substances

See requirement O20.

O74 Nanomaterial

The chemical product must not contain nanomaterials* as ingoing substances (See Definitions). Exemptions apply to:

- Pigments**
- Naturally occurring inorganic fillers***
- Unmodified synthetic amorphous silica
- Aluminium oxide

** See definitions.*

*** This exception does not include pigments added for purposes other than colour.*
**** This applies to fillers covered by Annex V item 7 of REACH*

- A declaration from the manufacturer of the chemical product(s) used in the surface treatment that the chemical product does not contain any nanomaterial.

Background to requirement O74 nanomaterials

The requirement is unchanged. However, an exemption for aluminium oxide in powder coatings has been introduced. Aluminium oxide is used as a "free flow additive" in powder coatings to improve the performance of the electrostatic powder coating and thus facilitate application. The aluminium oxide can be nano size because the best performance is obtained with very small particles. The coating does not contain any nano-size particles when it has cured, because the particles are bound into the polymer. The powder coating is applied at a factory and the workers use personal protective equipment. As stated previously, powder coating has environmental benefits, and Nordic Ecolabelling wants to allow this type of coating. An exemption has therefore been made for aluminium oxide. The exemption is also contained in the Nordic Swan Ecolabel’s criteria for Windows and exterior doors.

O75 Free formaldehyde

The content of free formaldehyde in each individual chemical product used for surface treatment must not exceed 0.2% by weight (2,000 ppm).

- A declaration from the manufactures of the chemical products in the surface treatment system.

Background to requirement O75 free formaldehyde

See requirement O23.

O76 Quantity applied and application method

The requirement applies if the surface-treated metal part makes up more than 5% by weight of the furniture/fitment.

For each surface treatment used, the following information must be provided by the furniture manufacturer:

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

The following levels of efficiency must be used when calculating the quantities of applied VOCs in subsequent requirement:

- Automated spray with no recycling, 50%
- Automated spray with recycling, 70%
- Spray application, electrostatic, 65%
- Spray application, bell/disk, 80%
- Roller varnishing 95%
- Blanket varnishing 95%
- Vacuum varnishing 95%
- Dipping 95%
- Rinsing 95%

The levels of efficiency are standard values. Other efficiency levels may be applied if they can be documented.

** The amount of application and the number of layers is not necessary to state for powder coating.*

t̄ A description from the furniture manufacturer of each surface treatment system that is used.

O77 Quantity of applied volatile organic compounds (VOC)

The requirement applies if the surface-treated metal part makes up more than 5% by weight of the furniture/fitment.

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

a) The total content of VOCs* must not exceed 5% by weight

b) The total amount of VOCs applied must not exceed 30g/m^2 treated surface

The applied quantity of VOCs according to alternative b) is calculated using the following formula:

$$\frac{\text{Applied amount of the surface treatment chemical } \left(\frac{\text{g}}{m^2}\right) x \text{ share of VOC in the surface treatment chemical (\%)}}{\text{Efficiency of the surface treatment (\%)}}$$

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

**Volatile organic compounds (VOCs) are defined as compounds with a boiling point of <250°C at 101.3 kPa (1 atm).*

- Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for each chemical product in the surface treatment system.
- A declaration from the manufacturers of the chemical products in the surface treatment system stating the quantities of VOCs in each product.
- A calculation from the furniture manufacturer showing that alternative b) in the requirement is met if the surface treatment system does not meet alternative a).

Background to requirement O77 quantity of applied VOC

The requirements for a description of surface treatment systems and the amount of VOCs applied is new for metal. The wording of the requirement is based on that for the requirement concerning VOCs in surface treatment processes for wood. The limit is 30g/m^2 treated surface. Nordic Ecolabelling has not previously had such a requirement and therefore has limited knowledge of VOC content in the products in question. However, the EU Ecolabel, Swedish Möbelfakta and the Swedish National Agency for Public Procurement have requirements for VOCs in wood, metal and plastic surface treatment processes. The EU Ecolabel places a limit of 30 g/m^2 but can allow up to 60 g/m^2 under certain conditions. Möbelfakta places limits of 35 and 60 respectively for domestic and non-domestic environments.

Powder coating is the most common method of surface treatment and does not use VOCs. However, it cannot be ruled out that other methods are used where VOCs might be a factor.

5.8.3 Production of metal

Separate requirements are set for the production of steel and the production of aluminium. The requirements can either be met by having a high proportion of recycled steel or aluminium, or by meeting requirements for virgin steel production and primary aluminium production.

O78 Production of steel

The requirement applies if steel is included with more than 30% by weight in the product.

The requirement can be met by documenting either A) High proportion recycled or B) Virgin steel production (B consist of 3 alternatives):

A) High proportion recycled

At least 75% by weight of the steel must be recycled.

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

The requirement can be verified either by:

- A signed agreement between the steel supplier and the manufacturer of the Nordic Swan Ecolabelled product stating that the requirement is met, or
- eBVD or EPD based on product-specific data/data from the steel producer´s own production specifically stating the content of recycled steel in the product.

or

B) Virgin steel production

The requirement can be met by one of the 3 alternatives (1–3) below:

The requirement can be verified using either: direct traceability through the supply chain, mass balance approach[56] or by all major suppliers[57].

1. Steel produced from traditional methods

Steel used in the Nordic Swan Ecolabelled product comes 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
- has 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 they shall be determined by the company management.

or

2. Steel production – Responsible steel certified production site

A minimum of 50% by weight of the steel used in the Nordic Swan Ecolabelled product comes from a production site that are certified according to the standard Responsible Steel[58], version 1.0, 2019 or later versions.

or

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

Steel used in the Nordic Swan Ecolabelled product comes from steel production sites that have implemented one of the following technologies:

- blast furnace top gas recycling with carbon capture and storage
- direct smelting reduction processes
- hydrogen steelmaking in shaft furnaces using green H2
- direct electrolysis of iron ore

[56] 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 producer of Nordic Swan Ecolabelled product (e.g., cannot sell a larger volume than the corresponding quantity purchased from the individual steel producers)

[57] All major suppliers are compliant with one of the 3 alternatives. Major suppliers are here defined as suppliers delivering 75% of the total volume (w/w) of steel components in the Nordic Swan Ecolabelled product.

[58] Overview of certified steel producers, https://www.responsiblesteel.org/certification/issued-certificates/

Recycled steel (A):

Alternative 1:

- Signed agreement/declaration between the steel supplier and the manufacturer of the Nordic Swan Ecolabelled product stating that the requirement is met. The declaration from the steel supplier can be based on purchase records/average data from several steel suppliers, or

Alternative 2:

- 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.

Virgin steel production (B):

Alternative 1:

- 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 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.

Alternative 2:

- 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 type of traceability used to document the requirement.
- Documentation from the manufacturer of the Nordic Swan Ecolabelled product that the requirement for share of purchased steel from certified steel producers is fulfilled – e.g., invoices or other documentation from suppliers.

Alternative 3:

- 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.

O79 Production of aluminium

The requirement applies if aluminium is included with more than 10% by weight in the product.

The requirement can be met by documenting either A) High proportion recycled or B) Primary aluminium production. (B consist of 4 alternatives):

A) High proportion recycled

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

Recycled aluminium 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 aluminium supplier and the manufacturer of the Nordic Swan Ecolabelled product stating that the requirement is met, or
- eBVD or EPD based on product-specific data/data from the aluminium producer´s own production specifically stating the content of recycled aluminium in the product, or
- Valid Hydro Circal certificate.

or

B) Primary aluminium production

The requirement can be met by one of the 4 alternatives (1–4) below:

The requirement can be verified using either: direct traceability through the supply chain, mass balance approach[59] or by all major suppliers[60].

1. Aluminium production – active sustainability strategy

Aluminium used in the Nordic Swan Ecolabelled product comes from a primary aluminium producer who has 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 they shall be determined by the company management.

or

2. Aluminium production – low direct climate effecting emissions

Aluminium used in the Nordic Swan Ecolabelled product comes from a primary aluminium producer whose direct climate-affecting emissions from primary aluminium production does not exceed 1,5 tonnes of CO2e/ton of aluminium produced.

or

3. Aluminium production – low electricity consumption for electrolysis

Aluminium used in the Nordic Swan Ecolabelled product comes from a primary aluminium producer whose electricity consumption for electrolysis does not exceed 15.3 MWh / ton produced aluminium.

or

4. Aluminium production – ASI certified site

A minimum of 50% by weight of aluminium used in the Nordic Swan Ecolabelled product comes from a production site that are certified to the ASI Performance standard[61].

[59] 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 producer of Nordic Swan Ecolabelled product (e.g., cannot sell a larger volume than the corresponding quantity purchased from the individual steel producers)

[60] All major suppliers are compliant with one of the 3 alternatives. Major suppliers are here defined as suppliers delivering 75% of the total volume (w/w) of steel components in the Nordic Swan Ecolabelled product.

[61] https://aluminium-stewardship.org/asi-standards/asi-performance-standard (visited November 2022)

Recycled aluminium (A):

Alternative 1:

- There must be a signed agreement between the producer of aluminium/supplier of aluminium and the manufacturer of the Nordic Swan Ecolabelled product 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.

Alternative2:

- eBVD or EPD can be used as documentation if these are based on product-specific data/data from the aluminium producer´s own production and specifically state the content of recycled aluminium in the product.

Alternative 3: Valid Hydro Circal certificate[62].

Primary aluminium production (B):

Alternative 1:

- 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.

Alternative 2:

- Declaration that the requirement is met, as well as calculation and indication of direct emissions in tonnes of CO2e/ton of aluminium produced.
- Information on type of traceability used to document the requirement.

Alternative 3:

- 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.

Alternative 4:

- 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 manufacturer of the Nordic Swan Ecolabelled product that the requirement for share of purchased aluminium from certified aluminium producers is fulfilled – e.g., invoices or other documentation from suppliers.

[62] https://www.hydro.com/en-DK/about-hydro/publications/certificates/ (November 2022)

Background to requirement O78 and O79 production of steel and aliminium

The requirement has been changed by now requiring either a high proportion of recycled or fulfilling requirements for virgin steel production and primary aluminium production. The limit for when the requirement is to be met has been lowered from 50% by weight of metal in the product in the previous generation and from the limit in the consultation document where it was 30% by weight of metal. Now the limits for when the requirements are to be met are 30% by weight for steel and 10% by weight for aluminium in the product. This is because aluminium weighs significantly less than steel.

Using recycled metal significantly reduces the environmental impact and provides a significant climate benefit. Among other things, this is highlighted in the taxonomy work in the EU[63]. Nordic Ecolabelling is aware that the availability of recycled metal and traceability can be a challenge. But in a world with an increasing focus on circular economy, Nordic Ecolabelling believes that there will be an increased focus on this in the future. 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 e.g. environmental work, working conditions and quality. Demand for traceability will hopefully contribute to the industry also placing increased focus on this. For Al, Hydro has launched its own traceability certification with a minimum of 75% recycled Al, Hydro Circal.[64] Currently, there is a smaller 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[65]. The industry average for EU-produced Al is approx. 50% recycled, while for Al outside the EU it is approx. 40%. The big environmental benefit comes from the use of post-consumer recycled aluminium.

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. The current requirement of 20% recycled metal has no significant impact since all steelworks, including the BOF plants, meet this today. It is therefore necessary to raise the requirement to promote the use of recycled steel and traceability. In practice, this means that steel that should contain more than 20% recycled steel must be produced at plants that use EAF technology. There are steel producers using the EAF process across the whole of Europe[66]. According to the World Steel Association[67] 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.

In this version of the criteria, Nordic Ecolabelling has for the first time introduced requirements for virgin steel production and primary aluminium production. Requirements for metal can therefore be met either by including a high proportion of recycled, or that several requirements for primary metal production are met. The requirement model is based on a mandatory requirement to the steel / aluminium producer to have an energy and greenhouse gas calculation with defined reduction targets. Certification with Responsible Steel or ASI is

[63] Taxonomy report, technical annex, EU technical expert group on sustainable finance, March 2020.
[64] https://www.hydro.com/en/products-and-services/low-carbon-aluminium/hydro-circal-75r/ (available 2019-10-17)
[65] https://www.hydro.com/en/media/news/2018/hydro-to-increase-production-of-post-consumer-recycled-aluminium/
[66] http://www.eurofer.org/About%20us/About%20Steel/EuropeanSteelMap.fhtml
[67] https://www.worldsteel.org/en/dam/jcr:96d7a585-e6b2-4d63-b943-4cd9ab621a91/World%2520Steel%2520in%2520Figures%25202019.pdf

something that Nordic Ecolabelling see as positive initiatives for a more sustainable metal production. These are independent certification systems with a focus on both 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 methodology used for EU-ETS benchmarks. Please note that these values may change based on the final outcome of the EU taxonomy work. For steel, 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 similar to those stated in the EU's technical annex to the taxonomy report[68].

5.9 Plastic, rubber and silicone

Polymer materials used as padding materials, e.g. polyurethane foam and textiles are not subject to the plastic requirements. For textile requirements, see chapter 5.10 and for padding materials, see chapter 5.11.

Small plastic parts (e.g. screws, staples, and fasteners) weighing less than 100 g are not covered by the requirements of Chapter 5.9. Electrical and electronic components, e.g. cables in height-adjustable tables and adjustable are also not covered by the requirements in chapter 5.9.

5.9.1 General requirements

O80 Types of plastic and reinforcement

Details must be provided of the types of plastic, fillers and reinforcements used in the plastic parts.

It is only permitted to reinforce plastic with fibreglass. Incorporation of other types of material into the plastic, e.g. wood fibre or bamboo (wood-plastic composite (WPC)) is prohibited.

- A description of plastic parts and types of plastic, fillers, and reinforcements in the plastic part.

Background to requirement O80 types of plastic and reinforcement

The requirement has been changed as plastic, which is mixed with other materials, e.g. wood raw material, so-called wood-plastic composite (WPC) is prohibited. It is also forbidden to reinforce plastic with e.g. carbon fibre due to the higher climate impact related to the production of carbon fibre compared to fibreglass. Wood plastic composite is prohibited because the two constituent materials cannot be separated in a recycling process and the recycling of WPC to new WPC is very limited today. WPC is also not a very common material in furniture / fitments today. Adding fibreglass also presents challenges for recycling, but it is possible to separate plastic and fibreglass even if this does not happen to

[68] 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

such an extent. Fibreglass can be important for giving the plastic the necessary strength, especially when using recycled plastic which is required in another requirement. Nordic Ecolabelling therefore finds it difficult to ban glass fibre reinforcement as it gives the plastic an important property that the addition of wood fibre cannot provide to the same extent. A lot is happening in the circular economy, waste management and recycling, and Nordic Ecolabelling is aware that the situation may change in this area within a relatively short time, also for materials such as WPC. Nordic Ecolabelling can therefore change attitudes towards WPC in the future, especially if good recycling schemes are established.

O81 Labelling

Parts that contain plastic and weigh more than 100 g must be clearly labelled in compliance with the ISO 11469 and ISO 1043 standards.

An exemption is made for plastic in rolls, e.g. edge trim.

An exemption may also be made if it is technically difficult to label, e.g. because of lack of space or the production method. In such cases, it must be explained why labelling is difficult and the exemption must be specifically approved by Nordic Ecolabelling.

- Information about plastic parts and how they are labelled. A description of any exemption that applies must be given in compliance with the requirement.

Background to requirement O81 labelling

The requirement applicable to the labelling of plastic parts is still in place and is aimed at helping with sorting and recycling at end-of-life. In many cases, manual sorting is replaced by a sorting technology using infrared light or sorting by density separation using a float/sink process. Labelling makes the sorting process simpler, however, when materials are sorted manually. It is mainly large parts that are separated out during a manual sorting process. The limit for labelling has therefore been raised from 50 g to 100 g. An exemption applies to plastic in rolls, e.g. edge trim. An exemption may also be made for other plastic parts if it is technically difficult to label them, e.g. because of lack of space or the production method used. In such cases, it must be explained why labelling is not possible.

ISO 11469 is a system for uniform labelling of products made of plastic and generic identification of the plastics is provided by the symbols and abbreviated terms given in ISO 1043.

O82 Bio-based plastics

It must be possible to recycle* the bio-based plastic in the product at today's recycling facilities.

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

- Documentation showing the materials contained in the product.

Background to requirement O82 bio-based plastic

Biodegradable and compostable plastic cannot be used, as they "pollute" the other plastic streams of recycled plastics in the Nordic region. Theoretically, these plastics can also be

recycled, but there are no systems for this today. Bio-based plastic in PET, PE and PP can be recycled in the same stream as fossil-based plastic in PET, PE and PP.

O83 Raw materials for bio-based polymers

Raw materials used in the production of bio-based polymers must meet the following requirements.

Palm oil and soy

Palm oil, soybean oil and soybean flour must not be used as raw materials for bio-based polymers.

Sugar cane

Raw materials from sugar cane must comply with a) or b) below:

a) Raw materials from sugar cane shall be waste * or residual products **. There must be traceability to the production / process where the residual production occurred.

b) Sugar cane must not be genetically modified.

   Sugar cane must be certified according to a standard that meets the requirements in Appendix 6.

   The manufacturer of the bio-based polymer must be traceability certified (CoC, Chain of Custody Certified) according to the standard sugar cane is certified according to. Traceability must as a minimum be ensured by mass balance. Book- and Claim systems are not accepted.

   The producer of the bio-based polymer must document that certified raw materials have been purchased for the polymer production, e.g. in the form of a specification on the invoice or delivery note.

Other raw materials

The name (in Latin and a Nordic or English language) and supplier of the raw materials used must be stated.

The raw materials must meet one of the following requirements:

a) Be waste* or residual products **. There must be traceability to the production / process, where the residual production occurred.

b) Primary raw materials, e.g. maize must not be genetically modified ***. Geographical origin (country / state) must be stated.

** Waste in accordance with EU Directive 2018/2001 / EC.*

*** Residual products as defined in EU Directive 2018/2001 / EC. Residual products come from agriculture, aquaculture, fishing and forestry, or there may be treatment of residues. A treatment of residual product means a substance that is not the end product(s) that a production process directly seeks to produce; it is not a primary aim of the production process and the process has not been deliberately modified to produce it. Examples of residual products are, for example, straw, bait, the non-edible part of maize, livestock manure and bagasse. Examples of processing residues are, for example, raw glycerol or brown lye from paper production. PFAD (Palm Fatty Acid Distillate) from palm oil is not considered a residual product and can therefore not be used.*

**** Genetically modified organisms are defined in EU Directive 2001/18 / EC.*

T̄ Declaration by the polymer manufacturer that palm oil (incl. PFAD (Palm Fatty Acid Distillate)), soybean oil and soybean flour are not used as raw materials for the bio-based polymer.

- For sugar cane: Indicate which certification system sugar cane is certified according to. Copy of valid CoC certificate or certificate number for the current traceability standard. Documentation as an invoice or delivery note from the producer of bio-based polymer which shows that certified raw material has been purchased for the production of the polymer. Declaration that sugar cane is not genetically modified.
- For waste and residual products: Documentation from the polymer producer, which shows that the requirement's definition of waste or residual products is followed, as well as traceability which shows where waste or residual product comes from.
- For primary raw materials: Declaration from the polymer manufacturer that raw materials have not been genetically modified according to the definition in the requirement.

Background to requirement O83 raw materials for bio-based polymers

The requirement is unchanged. In terms of resources and climate, it is positive to use renewable raw materials instead of fossil fuels. However, it is important that the cultivation of bio-based raw materials is sustainable. Establishment of palm oil plantations is one of the main reasons for deforestation of rainforests, and thus threatens the livelihoods of indigenous peoples, plants and animals. Rainforests are very important for biodiversity and are also important in regulating the climate. Soybeans are grown in areas that are often established at the expense of rainforests and forest waters in South America. Soy production is one of the biggest threats to the rainforest on the American continent, especially in the southern Amazon. Based on this, palm oil, soybean oil and soy flour are banned as raw materials for bio-based polymers.

Sugar cane is a relevant raw material for polymer production. Sugar cane is currently not as strongly associated with problems with deforestation of rainforest as mentioned above for palm and soybean oil, but there may also be challenges associated with this production. As bio-based plastic is still relatively new and the number of producers is relatively small, sugar cane is permitted as a raw material, but it is required that it be certified according to a sustainability standard that meets a number of requirements for e.g. protection of biological diversity. For all certification systems, there is a requirement for traceability at the mass balance level. Book and claim system will not be approved. In addition, there is a requirement that sugar cane and any other primary raw materials must not be genetically modified. Genetic modification is a debated topic, and several countries have banned the cultivation of GMOs. Topics discussed are food safety, land use, lack of knowledge about effects under local agricultural / forest conditions and the risk of negative environmental and health impacts. Nordic Ecolabelling emphasizes the precautionary principle and regulations that have a holistic approach to GMOs. This means that sustainability, ethics, and societal benefits must be emphasized together with health and the environment. We are not in principle against genetic engineering and GMOs per se but are concerned about the consequences when genetically modified plants, animals and microorganisms spread in nature. Nordic Ecolabelling believes that GMOs should be assessed on a case-by-case basis. Research results have not clearly shown that current GMO crops contribute to the development towards sustainable agriculture with less use of pesticides, and there is a lack of research on the long-term effects of genetically modified plants, both environmental consequences and socio-economic consequences. There are possible adverse effects of GMOs along the entire value chain from research and development of the plants, via

cultivation, to storage, use and waste management. In several of these phases, there is a lack of scientific studies, and there is a lack of overall assessments.

For other primary raw materials, there is a requirement that the name of the raw material, supplier and origin of the raw material must be stated. The most ideal is to use waste and residual products from other productions, e.g. by-products such as straw from cereal production and by-products from maize. By using secondary raw materials, parts that are not used as food are utilized. PFAD (Palm Fatty Acid Distillate) from palm oil is not considered a residual raw material and must therefore not be used. PFAD occurs in the production of palm oil for the food industry, and there is rarely traceability in the processes in which PFAD occurs.

O84 Nitrosamines in rubber

The following requirements apply to nitrosamines:

- The content of nitrosamines: ≤0.05 mg / kg rubber
- Total content of nitrosamine-soluble substances: ≤1 mg / kg rubber.

A declaration from the rubber manufacturer.

Background to requirement O84 nitrosamines in rubber

The requirement has been changed and harmonized with the level of requirements in the criteria for outdoor furniture, based on consultation responses received. Nitrosamines and nitrosamine-soluble substances are suspected to be carcinogenic. Nitrosamines are by-products formed in the production of rubber. Previously, the requirement was 0.01 mg / kg rubber for nitrosamines and 0.1 mg / kg vulcanised rubber, respectively, which corresponds to the levels in the EU Toys Directive and the safety standard EN 71–12 for toys for children under three years of age, which are intended to be put in his mouth. The requirement levels now equal the limits to the EU Toys Directive and the safety standard EN 71–12 for toys for children over the age of three, which are intended to be put in the mouth. This level is still strict, but more appropriate for the products in these criteria.

5.9.2 Chemicals in plastics

O85 Chemicals in recycled plastics

This requirement applies to chemicals in the recycled plastic raw material.

Recycled plastic must not contain:

- halogenated flame retardants
- cadmium
- lead
- mercury
- chromium VI
- arsenic
- phthalates

Impurities up to 100 ppm are permitted.

- A test report (XRF, X-ray fluorescence, atomic absorption spectroscopy (AAS) or equivalent method) from the supplier of the recycled plastic or manufacturer of plastic components showing compliance with the requirement. Alternatively, the requirement can be documented with traceability to the source to substantiate that these substances are not included.

Background to requirement O85 chemicals in recycled plastic

The requirement has been extended to include more substances in addition to halogenated flame retardants and is harmonised with the requirement in Floor coverings. The requirement applies to chemicals contained in the recycled plastic raw material and not chemicals that are added through regranulation. There are separate requirements for this, see O87. The requirement must be documented with a test report using X-ray fluorescence (XRF) or equivalent methods, or traceability to the source that substantiates that the specified substances are not included. The aim of the requirement is to capture the “worst substances”. Ways of documenting this were assessed during a review of the floor covering criteria and as part of an internal investigation by Nordic Ecolabelling in connection with amendments to the requirement applicable to plastics in Version 4 of Furniture and fitments. The dialogues held with floor covering and furniture manufacturers and suppliers of recycled plastics during this process showed that there are different practices in the industry for testing substances in recycled plastics. Some manufacturers rely on questionnaires/declarations from their subcontractors and follow them up with chemical analyses if it is considered likely that the plastic contains substances of concern. Some manufacturers of recycled plastic have XRF (X-ray fluorescence spectrometer) equipment for testing the plastic to see whether it can meet the given requirement (a level of 100 ppm can be achieved). Although this will entail extra documentation work, it shows that it is possible to set such a requirement. Using recycled plastic is good as it helps reduce resource use and stimulates a circular economy. At the same time, there is no wish to recycle chemicals that are harmful to health and the environment.

O86 Chemicals in re-used plastics

This requirement applies to plastic parts that are directly reused and not plastics that have undergone mechanical or chemical recycling. Reused plastic parts must not be used in products aimed at children.

Reused plastics:

- It must be stated what the plastic part was previously used for.
- Plastics may not be used from product areas where it is probable that halogenated flame retardants have been used. Alternatively, it can be documented with tests, see requirement O87.
- Any surface treatment must meet the requirements in chapter 5.9.3.

Please note that there is a general ban on the use of chlorinated plastics, such as PVC in O2.

- Information about previous types of use for the plastic part, and a declaration or similar from the supplier of the plastic part stating that the part does not contain halogenated flame retardants. Alternative test report, see O85.

Background to requirement O86 chemicals in re-used plastics

The requirement is new. If the furniture is to contain reused plastic parts (directly reused, not regranulate), it must be stated what the plastic was previously used for and substantiate that it does not contain halogenated flame retardants. Reusing is good, yet it is important not to recycle chemicals that are harmful to health and the environment. Nordic Ecolabelling does not want to be associated with halogenated flame retardants and has therefore set a requirement for this, even if it can be challenging to confirm that information. Reused plastic parts cannot be used in products aimed at children, as children often come "close" to the products, can eat on them, and are a more vulnerable group to the influence of chemicals. It is also emphasized that chlorinated plastics such as PVC are generally prohibited.

O87 Additives – prohibited substances

Additives in the list below must not be added to plastic, rubber, and silicon (both virgin and recycled plastic). This applies to additives actively added to the polymer raw material in the master batch or compound in production of plastic, rubber, or silicone.

- Substances on the Candidate List*

The following applies to the siloxanes D4, D5 and D6: D4 (CAS No. 556–67–2), D5 (CAS No. 541–02–6) or D6 (CAS No. 540–97–6) must only be included in the form of residues from raw material production and is permitted for each in quantities up to 1000 ppm in the silicone raw material (chemical).

- Substances that have been evaluated in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)**
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
    - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
    - List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called “Substances no longer on list”, and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn’t 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 on sub list II.

- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
    - halogenated organic pigments that comply with the Council of Europe recommendation "Resolution AP (89) 1 on the use of colorants in plastic materials coming into contact with food", point 2.5.

*** *Perfluorinated and Polyfluorinated alkyl substances are covered by their own bulletin and are not included in the exemption.*

- Butylhydroxytoluene (BHT, CAS No. 128–37–0)

- Aziridine and polyazidirines
- Bisphenols
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates****
- Phthalates
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

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

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

O88 Additives – CMR

Additives to plastic, rubber and silicone (both virgin and recycled plastic) must not be classified according to the table below. The requirement applies to additives actively added to the polymer raw material in the master batch or compound in production of plastic, rubber and silicone.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemptions apply to:

- The classification H351 for titanium dioxide (CAS No. 13463–67–7).
- The classification H361 for 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6).

- Safety data sheet for additives in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).
- A declaration from the plastics/rubber/silicon manufacturer.

Background to requirement O88 additives – CMR

The requirement is unchanged.

5.9.3 Surface treatment of plastic

Surface treatment of plastic edge bands is exempted for the requirements in this chapter (requirement O89–O95).

O89 Surface treatment

Surface treatment of plastic materials may be permitted if documentation can be submitted showing that this does not affect the potential for recycling.

- A declaration from the furniture manufacturer and documentation stating that the coating does not negatively affect the potential for recycling.

O90 Classification of chemical product

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

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372
Respiratory sensitization	Resp. Sens 1, 1A or 1B	H334

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

Note that responsibility for correct classification lies with the manufacturer.

Exemption applies to UV curing surface treatment products classified as environmentally hazardous if requirement O62 is met.

- Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for each chemical product in the surface treatment system.

- A declaration from the manufacturers of surface treatment products.

Background to requirement O90 classification of chemical product

Se requirement O18.

O91 Classification of ingoing substances

Ingoing substances (see Definitions) in the chemical product used for surface treatment must not have any of the classifications in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemptions apply to:

- The classification H351, H341 or H361 for photo initiators.
- The classification H351 for titanium dioxide (CAS No. 13463–67–7).
- The classification H361 for 1,1,1-Trimethylolpropane (TMP, CAS No. 77–99–6).
- The classification H351 for trimethylolpropane triacrylate (TMPTA, CAS No. 15625–89–5).
- The classification H361 for mequinol (CAS No. 150–76–5).
- The hardener in 2-component UV products can be exempted from the requirement if the following is met: it must be documented that the workers are not exposed to the components, e.g., by using safety equipment when mixing or that the mixing takes place automatically without exposure of the workers and that the application of the finished two-component system is done in a closed system.

T̄ Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for each chemical product in the surface treatment system.

T̄ A declaration from the manufacturers of surface treatment products.

Background to requirement O91 classification of ingoing substances

Se requirement O19.

O92 Prohibited substances

The following substances must not be an ingoing substance (See Definitions) in chemical products used for surface treatment:

- Substances on the Candidate List*

- Substances that have been evaluated in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)**
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
    - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
    - List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn't 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 on sub list II.

- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exceptions*** for:
    - Bronopol (CAS No. 52–51–7) may be present in the chemical product at a level of not more than 0.05% by weight
    - Mixture (3:1) of CMIT/MIT (5 chloro-2-methyl-4-isothiazolin-3-one CAS No. 247–500–7; 2-methyl-4-isothiazolin-3-one CAS No. 220–239–6) may be present in the chemical product at a level of not more than 0.0015% by weight
    - IPBC (Iodopropynyl butylcarbamate) may be present in the chemical product at a level of not more than 0.20% by weight
    - halogenated organic pigments that comply with the Council of Europe recommendation "Resolution AP (89) 1 on the use of colorants in plastic materials coming into contact with food", point 2.5
    - Epoxy acrylate used in UV curing coatings

*** *Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Isothiazolinones may be present in the chemical product at a level of not more than 0.05% by weight
- Butylhydroxytoluene (BHT, CAS No. 128–37–0)
    - An exemption is given for BHT in UV curing lacquers and paints. If BHT is given a harmonized official classification so that the substance does not meet the requirements of the criteria document, the exemption will no longer be valid.
- Aziridine and polyaziridines
- Bisphenol A, S and F
- Alkylphenols, alkylphenol ethoxylates and other alkylphenol derivates****
- Phthalates

- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Volatile aromatic hydrocarbons (VAH). They are permitted in the chemical product as an impurity at a level of not more than 1% by weight

**The Candidate List is available on the ECHA website: http://echa.europa.eu/candidate-list-table*

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

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

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

Background to requirement O92 prohibited substances

See requirement O20.

O93 Nanomaterial

The chemical product must not have nanomaterials* as ingoing substances (See Definitions). Exemptions apply to:

- Pigments**
- Naturally occurring inorganic fillers***
- Unmodified synthetic amorphous silica

** See definitions.*

*** This exception does not include pigments added for purposes other than colour.*
**** This applies to fillers covered by Annex V item 7 of REACH*

- A declaration from the manufacturer of the chemical product(s) used in the surface treatment that the chemical product does not contain any nanomaterial.

Background to requirement O93 nanomaterial

See requirement O21.

O94 Free formaldehyde

The content of free formaldehyde in each individual chemical product used for surface treatment must not exceed 0.2% by weight (2,000 ppm).

- A declaration from the manufactures of the chemical products in the surface treatment system.

Background to requirement O94 free formaldehyde

See requirement O23.

O95 Quantity of applied volatile organic compounds (VOC)

The requirement applies if the surface-treated plastic part makes up more than 5% by weight of the furniture /fitment.

For each surface treatment used, the following information must be provided by the furniture manufacturer:

a) Name of the surface treatment product and manufacturer of the surface treatment product

b) quantity applied (g/m^2), number of coats and application method(s) used.

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

- The total content of VOCs* must not exceed 5% by weight or
- The total amount of VOCs applied must not exceed 30 g/m^2 treated surface

The applied quantity of VOCs according to alternative b) is calculated using the following formula:

$$\frac{\text{Applied amount of the surface treatment chemical } \left(\frac{g}{m^2}\right) x \text{ share of VOC in the surface treatment chemical } (\%)}{\text{Efficiency of the surface treatment } (\%)}$$

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

For calculating the surface treatment efficiency, the following levels** of efficiency must be used:

- Automated spray with no recycling, 50%
- Automated spray with recycling, 70%
- Spray application, electrostatic, 65%
- Spray application, bell/disk, 80%
- Roller varnishing 95%
- Blanket varnishing 95%
- Vacuum varnishing 95%
- Dipping 95%
- Rinsing 95%

**Volatile organic compounds (VOCs) are defined as compounds with a boiling point of <250°C at 101.3 kPa (1 atm).*

***The levels of efficiency are standard values. Other efficiency levels may be applied if they can be documented.*

- Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for each chemical product in the surface treatment system.
- A declaration from the manufacturers of the chemical products in the surface treatment system stating the quantities of VOCs in each product.

- A calculation from the furniture manufacturer showing that alternative b) in the requirement is met if the surface treatment system does not meet alternative a).

Background to requirement O95 quantity of applied VOC

The requirement is new. The wording of the requirement is based on that for the requirement concerning VOCs in surface treatment processes for wood. The proposed requirement limit is 30g/m^2 treated surface. Nordic Ecolabelling has not previously had such a requirement and therefore has limited knowledge of VOC content in the products in question. However, the VOC limit set by Swedish Möbelfakta (the Swedish furniture industry's reference and marking system for furniture) for coatings of wood, metal and plastic is 35 for domestic settings and 60 for office/public/outdoor spaces.

5.9.4 Recycled/biobased plastics

O96 Recycled/biobased plastics

The requirement varies based on the plastic content in the product.

If plastic is included with more than 10% by weight in the product:

- At least 50% by weight of the plastic must consist of recycled material *

  or

- At least 50% by weight of the plastic must be bio-based.

If plastic is included with more than 30% by weight in the product:

- At least 50% by weight of the plastic must consist of recycled material. A minimum of 20% of this must be post-consumer

  or

- At least 75% by weight of the plastic must be bio-based.

The requirement to a minimum of 20% by weight of post-consumer/commercial plastic applies regardless of the total amount of recycled plastic.

**Recycled plastic is defined in the requirement according to ISO 1402, see terms/definitions.*

- The manufacturer of recycled raw materials must be specified. Documentation must confirm compliance with the requirement's definition or certification such as Global Recycled Standard, EuCertPlast, or an equivalent approved by Nordic Ecolabelling.
- Calculation that shows that the proportion recycled and if relevant the proportion of pre- and post-consumer plastic, as well as the proportion of bioplastic is met.

Background to requirement O96 recycled/biobased plastic

The requirement now applies generally for all types of plastic. The requirement previously specified 50% recycled content for PP, PET and PE and 30% for other types of plastic. PP, PET and PE are the plastics mainly used, and it is very hard to find recycled plastic of other plastic types of a good enough quality. It will also be possible to meet the requirement by using bioplastic. Nordic Ecolabelling wants to stimulate circular material choices by using recycled and bio-based materials. If plastic is included with a larger amount in the product (over 30% by weight), there is also a requirement that a minimum of 20% by weight of the plastic must be post-consumer.

5.10 Textiles

The requirements apply to textiles made of both synthetic and natural fibres with different requirements depending on their quantity and purpose in the product.

– Chapter 5.10.2 – 5.11.2 apply to covers on furniture, such as upholstery on sofas and sofa cushions, chairs, and mattresses. Outer covers on the bed frame and any accessories such as headboards also belong to this category.

– Chapter 5.11.3 apply to other textile parts such as textiles under sofa cushions, textiles on partitions, around the spring mattress on continental beds and around springs in a mattress.

Textiles with the Nordic Swan Ecolabel meet all the requirements in this section.

Textiles with the EU Ecolabel comply all the requirements except those for flame retardants. For approval, documentation must confirm that any added flame retardants meet requirement O103 and are not classified under the hazard classes listed in O105.

Definitions

The following applies in respect of requirements for chemicals:

These requirements apply to all chemicals used during the manufacture of textiles unless otherwise specified in the requirement. This includes bleaching, dyeing, printing, and finishing, such as coating, lamination or gluing. The requirements apply to chemical products used in dyeing plants/-houses.

The requirements do not apply to:

- chemicals used in water treatment plants.
- chemicals used for maintenance of production equipment.
- chemicals used in small quantities, such as levelling agents and de-sizing agents.

The following definition applies:

Ingoing substances:

All substances in the chemical product, including additives (e.g. preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g. formaldehyde, arylamine, in-situ generated preservatives) are also considered as ingoing substances.

Impurities:

Residuals, pollutants, contaminants etc. from production, incl. production of raw materials that remain in the raw material or in chemical product in concentrations less than 1000 ppm (0,1000% by weight, 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.

5.10.1 Material composition and material limits

A detailed overview must be provided, specifying the textile parts, fibre types, applicable requirements, and suppliers of the various textile components.

O97 Material composition

The following information must be provided:

- An overview of textile parts and their use in the product
- Fibre types (such as cotton, viscose, wool, polyester etc). When mixing two or more fibre types in the textile part, the weight% of the different fibre types must be stated.
- Materials in any membranes / coatings must be specified
- Supplier of the textile parts
- If recycled textiles have been used, this must be stated
- If the textile part is ecolabelled with the Nordic Swan Ecolabel or EU Ecolabel, this must be stated. See O98.

T̄ Schematic overview containing the above information for all textile parts in the furniture.

O98 Ecolabelled textile

If the textile is ecolabelled with the Nordic Swan Ecolabel, all the requirements in this chapter are fulfilled.

If the textile is ecolabelled with EU Ecolabel and it contains flame retardants, O103 and O105 must also be fulfilled.

T̄ Textile labelled with Nordic Swan Ecolabel: Submit name of textile, manufacturer and license number.

T̄ Textile labelled with EU Ecolabel: Submit name of textile, manufacturer and license number. Documentation according to O105 and O107.

O99 Material limits

The following material limits apply:

- Sewing thread, furniture knobs, elastic bands, textiles on zippers and velcro are not covered by requirements.
- Textile parts that make up less than 1% by weight of the textile included are exempt from the requirements.
- Fibre types to which no requirements are imposed in the criteria can be included in a maximum of 5% by weight in the individual textile part. Types of fibres included in the criteria are cotton, linen and other bast fibres, wool and other keratin fibres, regenerated cellulose fibres (e.g. viscose), acrylic, polyamide, polyester and polypropylene. In addition, recycled textile fibre can be included.

T̄ Description showing that material limits in the requirement are complied with. The material overview from requirement O97 can be used as a basis.

O100 Metal details

Buttons, zippers and other details in metal must meet the following requirements:

- Lead (Pb): <90 mg / kg (Digested sample, Detection GC-ICP-MS)
- Cadmium (Cd): <40 mg / kg (Digested sample, Detection GC-ICP-MS)

ī Test report for the relevant metal material (for example buttons) which shows that the requirement is met. Alternatively, the requirement can be documented with a GOTS or Oeko-Tex 100 class I certificate.

Background to requirements O97–O100

The material composition of fibre and textile provide important information in the application process. Textile that is ecolabelled with the Nordic Swan Ecolabel automatically comply with requirements in this chapter. EU ecolabelled textile containing flame retardants needs additional documentation to comply with O103 and O104.

5.10.2 Covers – chemicals

The requirements in this chapter 5.10.2 (chemicals) and in chapter 5.10.3 (production of fibre), apply to:

1. Cover / upholstery on seating furniture (sofas, chairs, benches, etc.)
2. Mattress cover (including intermediate mattress in continental beds)
3. Cover on bed frames and any headboard

Please note that there are quality requirements in chapters 5.10.4–5.10.6 depending on the type of textile and use (seating furniture, coated textile materials and mattress covers).

The requirements apply to the individual textile fibre which constitutes more than 10% by weight in the constituent textile. Many of the requirements in this chapter are harmonized or partially harmonized with the requirements set out in the criteria for Nordic Ecolabelling of textiles, leather and hide. Reference is therefore made to the background document for these criteria for a more general background to the textile requirements.

O101 OEKO-Tex 100 certified textile

Textiles must be Oeko-Tex 100 (Class I or II) certified.

ī Valid certificate from Oeko-Tex 100, Class I or II.

Background to requirement O101 Oeko-Tex 100 certified textile

The requirement has been added to the criteria after NMN (Nordic Ecolabelling Board) decision to simplify the documentation of the requirement. In previous criteria version all production chemicals were to be declared by the manufactures of chemicals. This turned out to be very complicated and time consuming. Oeko-Tex 100 class I or II certification ensures that textiles are tested for the content of a wide range of chemicals.

O102 Biocides and antibacterial substances

Chemicals with the following properties may not be added to and/or used in fibres, rolls of fabrics or the final textile product:

- Antibacterial substances (including silver ions, silver nanoparticles and copper nanoparticles)
- Biocides in the form of pure active substances or as biocidal products.

This requirement also applies to the transport of the textiles.

The ban does not apply to natural antibacterial effect in materials.

Preservation used in chemical raw materials ("in can" preservation is not covered by the ban).

- A declaration of compliance with the requirement from the manufacturer/supplier of textile.

Background to requirement O102 biocides and antibacterial substances

Biocidal products and antibacterial products are not desirable in ecolabelled products. Frequent use of antibacterial agents in common consumer products can lead to bacteria becoming more resistant and eliminate beneficial bacteria. Two of the antimicrobial agents that are commonly added are silver nanoparticles and copper nanoparticles. There has been particular concern that silver nanoparticles released into effluent and wastewater could eliminate beneficial bacteria and cause resistance in bacteria. Other examples of antibacterial agents that may not be used are organotin compounds, chlorophenols and dimethyl fumarate which are used, for example, as fungicides or pesticides during transport and storage of textiles.

The ban does not apply to in-can preservatives for use in adhesives, coatings, etc. In these cases, the biocide acts as a preservative that protects the chemical product during storage.

O103 Flame retardants

The following flame retardants must not be added to and/or used in fibres, rolls of fabrics or the final textile product:

- Halogenated flame retardants
- Organophosphate flame retardants

Flame retardants must also meet requirement O105

- A declaration from the textile manufacturer stating that no halogenated and/or organophosphate flame retardants have been added to textiles or during the production process.
- Documentation in compliance with the requirement O105

Background to requirement O105 flame retardants

Nordic Ecolabelling wants stringent requirements to apply to flame retardants. However, it does not want to prohibit flame retardation as a function.

Some flame retardants have a number of adverse health and environmental effects. At the same time, flame retardancy can be an important property and documentation about flame

retardant properties is often required in public tenders. This makes it important to find a balance between fire safety and the use of chemicals that are harmful to health and the environment. Wool and some other textile fibres have an inherently lower flammability. It is not necessary to add flame retardants to these fibres e.g. if using woollen textiles as sofa covers. Synthetic textiles or a blend of synthetic and natural fibres are frequently used in mattresses. These are more flammable.

Europe does not have a common standard for testing the flammability of furniture, making the use of flame retardants in furniture a complicated issue. Some countries like the UK and Ireland require the flammability of textiles to be tested using the open-flame test method. It has been difficult to perform this test without the use of flame retardants with hazardous properties. SafeFurnitureEurope is working, among other things, to focus on the problematic use of flame retardants in furniture and considers that there is no clear evidence that fire safety increases by requiring such tests[69]. Instead, flame retardants may even make fires more dangerous for firefighters and those being rescued, as flame retardants have very negative impacts on human health and the environment.[70]

Nordic Ecolabelling thus sets a requirement prohibiting the flame retardants that we know are particularly harmful to the environment and/or health. It is not necessary to use these flame retardants to meet standards stipulated in public sector tenders in the Nordic countries. The ban on halogenated flame retardants is still in place. Furthermore, a ban on organophosphate flame retardants has been introduced. TCEP is a phosphate-based flame retardant with serious impacts on human health and the environment. TCEP could impair fertility and is harmful if swallowed. The substance is also toxic to aquatic life with long lasting effects. TCEP is designated as a substance of very high concern (SVHC) and is on Norway's Priority list of environmentally hazardous substances. Other organophosphorus flame retardants are persistent organic pollutants that last a very long time in the environment and are also bioaccumulative, which means they accumulate inside cells and living organisms.[71] Non-chlorinated organophosphorus flame retardants can also have undesirable properties, such as TPP (triphenylphospine) and TCP Tris (methylphenyl) phosphate[72],[73] ,[74] ,[75].

A study from the USA shows that the amount of phosphorus-based organic flame retardants in the environment is often higher compared to the top exposure levels of PBDE[76]. This

[69] OPINION of the French Agency for Food, Environmental and Occupational Health & Safety concerning the "request regarding the fire safety of domestic upholstered furniture" , 2015, https://www.anses.fr/en/system/files/CONSO2011sa0132Ra-02EN.pdf
[70] European Social Dialogue Committee for Furniture, Brussels, 21 March 2018: https://docs.wixstatic.com/ugd/a1d93b_80d870dc93bd4585af6d583f4ff3a712.pdf
[71] https://miljostatus.miljodirektoratet.no/tema/miljogifter/prioriterte-miljogifter/fosfororganiske-flammehemmere/
[72] https://toxicfreefuture.org/key-issues/chemicals-of-concern/tpp/
[73] https://echa.europa.eu/brief-profile/-/briefprofile/100.009.124
[74] https://echa.europa.eu/brief-profile/-/briefprofile/100.239.100
[75] Ike van der Veen and Jakob de Boer, 2012: Phosphorus flame retardants: Properties, production, environmental occurrence, toxicity and analysis, Chemosphere, volume 88, Issue 10, August 2012, pages 1119-1153
[76] Ike van der Veen and Jakob de Boer, 2012: Phosphorus flame retardants: Properties, production, environmental occurrence, toxicity and analysis, Chemosphere, volume 88, Issue 10, August 2012, pages 1119-1153

indicates both that there is widespread use (which may not be comparable to use in Europe), but also that they are persistent in the environment.

On 15 March 2022, Nordic Ecolabelling decided to approve the use of phosphorus-based flame retardants in certain cases where the regulatory requirements require testing in accordance with EN 597–2 or equivalent ("open-flame test"). Products that contain organic phosphorus-based flame retardants can only be sold as Nordic Swan Ecolabelled for those purposes and in those markets where the regulatory requirements require testing with EN 597–2 or equivalent.

In addition, it is emphasised that any flame retardants must meet the requirement for classification of chemicals.

O104 Coatings, laminates and membranes

Coatings, laminates and membranes used in fibres, rolls of fabrics or the final textile product must not contain:

- Halogenated polymers are (e.g., PVC / PVDC containing chlorine and PTFE containing fluorine).

T̄ Declaration from the manufacturer of the textile that the requirement is fulfilled.

Background to requirement O104 coatings, laminates and membranes

The requirement corresponds to the requirement set out in the criteria for Nordic Ecolabelling of textiles. The ban on halogenated polymers means that coatings, laminates and membranes coated with or based on e.g. chlorinated polymers and per- and polyfluorinated compounds are prohibited

O105 Classification of chemical products

Chemical products used in the dyeing process shall not be classified in any of the hazard categories in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311

	Acute Tox 3	H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372
Sensitising on inhalation or skin contact	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334** H317**

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

*** Non-disperse dyes are exempt from the prohibition of H334 and H317, provided that non-dusting formulations are used or that full or semi-automatic dosing is used. If semi-automatic dosing is used, the manual handling of the dyes must be carried out using the correct personal protective equipment in accordance with safety data sheets (SDS) and/ or the use of technical measures such as local ventilation.*

- Declaration from the textile manufacturer that the requirement is fulfilled.
- For exempted non-disperse dyes: Declaration that non-dusting formulations of these are used or that the requirement to full or semi-automatic dosing is fulfilled.
- Safety data sheet for chemicals in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

Background to requirement O105 classification of chemical products

The requirement is set for all chemicals used in dyeing plants/-houses. The requirement has been harmonised with the proposed revised criteria for the Nordic Swan Ecolabelling of textiles, hide and leather. Disperse dyes often have poor colour fastness because they are not covalently bound to the textile fibre. It is therefore greater risk of exposure to disperse dyes. Requirements are therefore more stringent for disperse dyes that are classified as allergens[77].

5.10.3 Covers – fibre production

The requirements for fibre apply to the textile fibre with a content in the textile part of more than 10% by weight. This means that e.g. for a blend of 90% cotton and 10% polyester, only the requirements for cotton must be met. The requirements for fibre are new. Some of the requirements are harmonised with requirements in the new criteria for the Nordic Swan Ecolabelling of textiles, hide and leather. Other requirements are based on requirements in the current version of the textile criteria and/or criteria for the Nordic Swan Ecolabelling of Baby products with textiles.

O106 Cotton

Cotton and other cellulose seed fibres (including kapok) must be:

- organically farmed* or
- recycled** or
- GOTS certified or

- grown in compliance with one of the following standards: BCI (Better Cotton Initiative), CmiA (Cotton made in Africa) or FairTrade for cotton.

**Organic means cotton that is certified organic or is grown during the transition period to organic cultivation in accordance with a standard approved in the IFOAM Family of Standards. See definitions for more details.*

*** Recycled fibres or materials: Pre-consumer or post-consumer recycled raw materials, c.f. the definition given in the ISO 14021 standard. Both mechanical and chemical recycling are included. See definitions for more details.*

- A valid certification showing that the cotton in the Nordic Swan Ecolabelled product has been organically grown or grown in compliance with the standards in the requirement. If the GOTS certification is held by the subcontractor, a transaction certificate is required showing that the product being shipped is GOTS certified. Documentation for BCI cotton must show traceability back to the BCI farmers.
- Documentation for recycled fibres must be either a) or b):
  a) Global Recycled Standard certificate showing that the raw material has been recycled or other equivalent certification approved by Nordic Ecolabelling.
  b) documentation showing that the recycled fibres were purchased as recycled and the name of the supplier.

Background to requirement O106 cotton

The cultivation and harvesting of cotton are associated with serious environmental and health problems. This is mainly caused using pesticides, fertilisers, and other chemicals during cultivation. Other factors, such as water consumption (irrigated or rainwater), monoculture, land use also have significant impacts on the environment[78]. There are several ways to reduce adverse effects on health and the environment in the production of cotton. Integrated Pest Management (IPM) promotes measures such as the use of personal protective equipment, training farmers in the use of pesticides, and improved control of the pesticides used. A reduction in the use of artificial fertiliser and energy is also a requirement.

The environmental impact can also be reduced through organic cultivation and farming that does not use synthetic pesticides or artificial fertilisers and does not allow genetically modified cotton. One of the environmental problems that organic production does not solve is the problem related to artificial irrigation. Organic cultivation today is primarily located in areas where rainwater is the main source of water, which reduces the problems associated with water consumption[79]. Although organic production does not necessarily result in reduced water consumption, the run-off water quality will be significantly better for both humans and nature. It is difficult to say whether there is any difference between cotton yields in conventional and organic production. One of the reasons for this is that yields already differ greatly within individual systems. Various studies suggest that IPM produces the

[78] Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Textile Products – Technical report and criteria proposal, Working document, European Commission, Joint Research Centre Institute for Prospective Technological Studies (IPTS) 2013.
[79] 28 “The sustainability of cotton – consequences for man and the environment”, Kooistra K., Termorshuizen A and Pyburn R., Wageningen University & Research Center, report no. 223, April 2006

highest yields of the three production methods and that approx. 20% of global cotton production is IPM[80].

O107 Flax and other bast fibres

Flax and other bast fibres (e.g. ramie, hemp and jute) must only be farmed with pesticides allowed under the EU Regulation No. 1107/2009.

Valid certificate from European Flax Standard or equivalent.

Background to requirement O107 flax and other bast fibres

Use of natural fibres in textiles has the advantage of not directly relying on fossil resources. However, it is increasingly relevant to consider whether these natural fibres are sustainably farmed with minimal harm to the environment. For example, ensuring that harmful pesticides that can lead to loss of biodiversity are not used. Only pesticides allowed under the EU Regulation No. 1107/2009 may be used in the cultivation of flax and other bast fibres, such as hemp.

O108 Wool and other keratin fibres

Any wool and other keratin fibres used must originate from sheep, camels, alpaca or goats, and must be one of the following:

1. certified organic wool*

   or

2. recycled wool**

   or

3. conventional wool with documentation that the requirement below concerning pesticide content in the raw wool is fulfilled.

Pesticide content in conventional wool:

- The total content of the following substances may not exceed 0.5 ppm:

  γ-hexachlorocyclohexane (lindane), α-hexachlorocyclohexane, β-hexachlorocyclohexane, δ-hexachlorocyclohexane, aldrin, dieldrin, endrin, p,p'-DDT and p,p'-DDD, cypermethrin, deltamethrin, fenvalerate, cyhalothrin and flumethrin.

- The total content of the following substances may not exceed 2 ppm: diazinon, propetamphos, chlorfenvinphos, dichlorfenthion, chlorpyriphos, fenchlorphos, dicyclanil, diflubenzuron and triflumuron.

The requirement to test for pesticide residues does not apply if documentation can show which farmers produced at least 75% by weight of the wool or keratin fibres, and those farmers can confirm that the substances named in the requirement have not been used in the areas or on the animals in question.

Test method: The tests must be performed in accordance with IWTO Draft Test Method 59: Method for the Determination of Chemical Residues on Greasy Wool or equivalent.

[80] Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Textile Products – Technical report and criteria proposal, Working document, European Commission, Joint Research Centre Institute for Prospective Technological Studies (IPTS) 2013.

The analysis must be performed on raw wool before wet processing and the test report must be submitted with the application. Thereafter, the applicant must have a procedure in place for annual testing in line with the requirement and for ensuring compliance with the requirement. Nordic Ecolabelling must be informed if the requirement is not fulfilled.

**Definition of organic wool: wool fibre that is certified as organic or transitioning to organic according to a standard approved in the IFOAM Family of Standards, such as Regulation (EU) 2018/848, USDA National Organic Program (NOP), APEDA's National Programme for Organic Production (NPOP), China Organic Standard GB/T19630. Also approved are GOTS and DEMETER and certification as "transitioning to organic cultivation". The certification body must have the accreditation required for the standard, such as ISO 17065, NOP or IFOAM.*

*** Definition of recycled wool: Pre-consumer or post-consumer recycled raw materials, see the definition in the ISO 14021 standard. Both mechanically and chemically recycled fibres are included. See the definitions in section 5.2 for more details.*

Organic wool:

- Valid certificate showing that the wool in the Nordic Swan Ecolabelled product was organically cultivated in line with the standards in the requirement. If the supplier is the holder of GOTS certification, the requirement must be documented with a transaction certificate showing that the goods supplied are GOT certified.

Recycled fibre:

- Fulfilment of the requirement is documented for recycled fibre with either a or b below:
  a) Global Recycled Standard certificate showing that the raw material is recycled, or other equivalent certification approved by Nordic Ecolabelling.
  b) Present documentation demonstrating that the recycled fibre was purchased as recycled and state the supplier.

Conventional wool:

- A test report showing that the pesticide requirement has been fulfilled. A written procedure showing how an annual test is performed in line with the pesticide requirement, along with annual in-house checks of compliance with the requirement. An alternative to the pesticide test is a confirmation from the farmers that the stated substances are not used, plus an overview of the proportion of wool concerned.

Background to requirement O108 wool and other keratin fibres

The requirement only allows wool fibres from sheep and other keratin fibres from camels, alpaca and goats. Angora wool from the Angora rabbit is not allowed.

Wool scouring wastewater often contains a high concentration of pesticide residues from the sheep dipping process. Pesticide residues that find their way into natural water bodies can cause toxic impacts. At the same time, organochlorine pesticides that are toxic, non-readily degradable and bioaccumulative will be harmful to the environment while active in the wool. Despite a ban, these types of pesticides are still being used[81]. Wool scourers and wool exporters have the greatest ability to influence the use of ectoparasites (pesticides) by placing absolute requirements on the wool producers (farmers). This requirement can thus be documented by at least 75% of wool farmers declaring that they do not use the

[81] Ravidnran, J. et al., Organochlorine pesticides, their toxic effects on living organisms and their fate in the environment, Interdiscip Toxicol. 2016 Dec; 9(3-4): 90–100

ectoparasites specified. Organic wool automatically meets the requirement. According to the International Wool Textile Organization (IWTO), less than 1% of global sheep farming was organic in 2015[82]. It has therefore been adjudged that requiring wool to be organic is too strict.

O109 Ban on mulesing

Surgical mulesing and mulesing performed using liquid nitrogen are not permitted on merino sheep.

- Declaration from the merino wool producer, stating that no mulesing has taken place. The requirement can also be documented with a valid certificate showing that the production of wool is certified according to Responsible Wool Standard, version 2 or later.

Background to requirement O109 ban on mulesing

Mulesing remains a problem associated with merino wool. Merino sheep are specially bred to have wrinkled skin, so that they produce more wool. This causes urine and faeces to collect around the hind quarters, which attracts flies, who then lay eggs in the folds of skin. Surgical mulesing involves removing wool and skin on the rear end of the sheep to avoid parasites from egg-laying flies. This method is primarily used in Australia. The requirement prohibits this type of treatment and must be documented with a declaration from the wool producer stating that mulesing is not performed.

O110 Synthetic fibres

Synthetic fibres must either be recycled or meet the requirements below for acrylic, polyamide, polyester and polypropylene.

Recycled:

- Recycled plastics must not be used if they are approved for food contact and originate from facilities that are EFSA* or FDA** approved or are marketed as compliant with these.

Acrylic:

- The residual acrylonitrile content in raw fibres from the fibre production plant must be less than 1.5 mg/kg. The amount of acrylonitrile must be measured using the following method of analysis: Extraction with boiling water and quantification with capillary gas-liquid chromatography.
- N,N-Dimethylacetamide (DMAc, CAS No. 127–19–5) must not be used in the production of acrylic

Polyamide:

- Emissions of nitrous oxide (N2O) to the air from the production of monomers must not exceed 10 g/kg produced polyamide 6-fibre and 50 g/kg produced polyamide 6.6-fibre, expressed as an annual average.

[82] International Wool Textile Organization (IWTO), “Wool Production”. Viewed September 7, 2017: http://www.iwto.org/wool-production

Polyester:

- The amount of antimony in polyester fibre measured as an annual average must not exceed 260 ppm. Antimony must be tested using the following method: Direct determination by atomic absorption spectrometry. The test must be conducted on raw fibre prior to wet treatment

  or

- The amount of extractable antimony in the final textile must not exceed 30 mg/kg (30 ppm) for tests done with extractable antimony using AAS and ICP spectrometry (identically to requirement in Oeko-Tex 100, class I or II).

Polypropylene:

- Lead-based pigments must not be used.

** In line with Commission Regulation (EC) No 282/2008 of 27 March 2008 on recycled plastic materials and articles intended to come into contact with foods.*

*** In line with the Code of Federal Regulations Title 21: Food and Drugs, PART 177 – INDIRECT FOOD ADDITIVES: POLYMERS*

- For recycled fibre: A declaration from the manufacturers of recycled raw materials stating that the raw materials are not EFSA or FDA approved, c.f. the requirement. Certificate for third party certification of the supply chain (e.g. Global Recycled Standard) or documentation from the manufacturer showing that the feedstock used in the raw material is 100% recycled material, c.f. the definition in the requirement
- Acrylic: An analysis report from the manufacturer of acrylic showing compliance with the requirement. A declaration from the manufacturer of acrylic that DMAc has not been used.
- Polyamide: A test report or monitoring data, together with a declaration of compliance from the manufacturer of polyamide showing compliance with the requirement.
- Polyester: A declaration from the manufacturer of polyester showing that antimony has not been used or a test report showing compliance with the requirement or
- Polyester: Test report or Oeko-Tex 100 (class I or II) certificate showing fulfilment of the requirement.
- Polypropylene: A declaration from the manufacturer of polypropylene that lead-based pigments have not been used.

Background to requirement O110 synthetic fibres

The requirement is new and is based on requirements in the criteria for the Nordic Swan Ecolabelling of Baby products with textiles.

Recycled textiles

Nordic Ecolabelling wants to support the circular economy through the use of recycled materials instead of virgin materials, which in this case is crude oil. However, fibre to fibre recycling is still limited for textiles[83] and recycled polymers from other synthetic materials are frequently used today as different plastic materials. The requirement thus accepts both fibre to fibre recycling and polymer fibre recycling. There are reasonable opportunities for using

[83] PULSE OF THE FASHION INDUSTRY, Global Fashion Agenda & The Boston Consulting Group 2017

recycled fibre types like polyester and polyamide today. The opportunities for other fibre types are not yet quite the same (August 2019).

The article “Environmental impact of textile reuse and recycling – A review”[84] reports that it is well documented that textile reuse and recycling in general minimises negative impacts on the environment compared with incineration and landfill, and that reuse is more beneficial than recycling.

There is a ban on the use of regranulate that is approved for contact with foods by the EFSA under Regulation No. 282/2008 or FDA in compliance with Code of Federal Regulations Title 21: Food and Drugs, PART 177—INDIRECT FOOD ADDITIVES: POLYMERS. It is considered inappropriate that raw materials which are approved for production of food packaging should be used in the production of textiles. The highest levels of traceability and purity are required for plastic raw materials used in packaging in contact with food. The use of these plastics for anything other than food contact is therefore downcycling.

The requirement stipulates that feedstock used in the recycled raw material must be fully traceable. Without proper traceability, it is difficult to ascertain that the material is actually recycled. Documentation regarding traceability should be available, e.g. a certificate from a third party’s certification of the supply chain, such as Global Recycled Standard. Alternatively, the manufacturer of the recycled raw material can document the traceability by declaring that 100% recycled feedstock has been used.

Acrylic

Acrylic fibres are produced through polymerisation of acrylonitrile (min. 85%) with a comonomer (max. 15%). Acrylonitrile is relatively toxic and classified as carcinogenic.[85] Nordic Ecolabelling therefore sets requirements for residual monomers in the polymer and for emissions of acrylonitrile in the process. Toxic solvents are also used in the spinning process, dimethylformamide (DMF) or N,N-Dimethylacetamide (DMAc). DMAc (CAS No. 127–19–5) is also on the Candidate List. Since it is difficult to find good alternatives, Nordic Ecolabelling allows the use of DMF, but not the use of DMAc in the production of acrylic, as this is on the Candidate List.

Polyamide

The requirement has been harmonised with the requirement set in Version 4 of the Nordic Swan Ecolabelling of Textiles and Version 1 of Baby products with textiles. The requirement concerns emissions of nitrogen dioxide (N2O) gases from the production of monomers in polyamide production.

Polypropylene

The requirement has been harmonised with the requirement set in Version 4 of the Nordic Swan Ecolabelling of Textiles. Inorganic pigments are used to dye the fibre the correct colour. The use of lead-based pigments is therefore prohibited in the production of polypropylene.

[84] Sandin, G, Environmental impact of textile reuse and recycling – A review, Journal of Cleaner Production Volume 184, 20 May 2018, Pages 353-365
[85] EU Ecolabel’s background report; “Establishment of ecological criteria for textile products”, final report, April 1998

Polyester

The production process for PET fibre often uses the catalyst diantimony trioxide (Sb2O3). Antimony trioxide (CAS No. 1309–64–4) is mentioned in the 2014[86] report “Everything you (don’t) want to know about plastic” by the Swedish Society for Nature Conservation as carcinogenic and as the key catalyst in PET production. Nordic Ecolabelling wants to limit the content of antimony as it is a substance of very high concern. Polyester usually contains antimony in concentrations of 150–350 ppm (mg/kg).[87]

New alternative test for antimony have been added the requirement. The amount of extractable antimony in the final textile must not exceed 30.0 mg/kg (30 ppm). Extractable antimony must be tested using AAS and ICP spectrometry (identical to requirement in Oeko-Tex 100). Documentation: Test report or Oeko-Tex 100 certificate showing fulfilment of the requirement.

O111 Regenerated cellulose (e.g. lyocell)

The following requirements apply to regenerated cellulose:

- Chlorine gas (Cl_2) must not be used to bleach cellulose pulp or cellulose fibre.
- Sulphur emissions (viscose and modal fibre) to the air must not exceed 120 g S/kg of filament fibre and 30 g/kg of staple fibre expressed as an annual average. Measurement of sulphur emissions must be in accordance with ISO 7934, ISO 7935 or equivalent standards.
- Zinc emissions (viscose) to water must not exceed 0.3 g Zn/kg of regenerated cellulose, expressed as an annual average.

- A declaration from the manufacturer of regenerated cellulose that chlorine gas has not been used for bleaching.
- An analysis report showing emissions of sulphur.
- An analysis report showing emissions of zinc.

Background to requirement O111 regeneratied cellulose

Cellulose pulp or cellulose fibres must not be bleached using chlorine gas. Chlorine gas is no longer used in Europe, but its use has not ended everywhere in the world. Chlorine gas is an effective bleaching agent, but it causes considerable emissions of organochlorine substances. ECF and TCF are examples of better alternative methods that are used for bleaching cellulose pulp. The requirement aims to reduce emissions of AOX by prohibiting the use of chlorine for bleaching. The manufacture of viscose generates emissions of sulphur and zinc. Therefore, a requirement restricting emissions of these substances has been made.

[86] Klar, M., Gunnarsson, D., Prevodnik, A., Hedfors, C. and Dahl, U., “Everything you (don’t) want to know about plastic”, the Swedish Society for Nature Conservation, 2014
[87] The Danish Environmental Protection Agency, Environmental Project No. 892, 2004, Antimon - forbrug, spredning og risiko (Antimony - use, spread and risks)

O112 Regenerated cellulose – tree species

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

a) CITES (Appendices I, II and III)

b) IUCN red list, categorized as CR, EN and VU

c) Rainforest Foundation Norway´s tree list

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

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

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

- the tree species does not originate from an area/region where it is IUCN red listed, categorized as CR, EN or VU.
- the tree species does not originate from Intact Forest Landscape (IFL), defined in 2002 http://www.intactforests.org/world.map.html.
- the tree species must originate from FSC or PEFC certified forest/plantation and must 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 plantation shall in addition originate from FSC or PEFC certified forest/plantation, established before 1994.

Exemptions:

Eucalyptus and acacia are exempted from the list. Eucalyptus/Acacia must be at least 50% certified and come from forests / plantations managed in accordance with sustainable forestry management principles that meet the requirements of FSC or PEFC. The remaining share must be from controlled sources (FSC controlled wood or PEFC controlled sources).

**The list of restricted tree species is located on the website: https://www.nordic-swan-ecolabel.org/pulp-paper-declaration-portal/what-can-be-declared/forestry-requirements/*

☐ Declaration from the applicant/manufacturer/supplier that tree species listed on a-d) are not used.

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

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

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

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

- For pulp of eucalyptus / acacia: valid traceability certificate from the pulp producer and documentation showing that the certification requirement of a minimum of 50% is fulfilled and that the remaining share comes from controlled sources.

Background to requirement O112 tree species with restricted use

See requirement O25.

O113 Traceability and certified raw materials

The requirement applies if the regenerated cellulose fibre content in the textile is more than 50%.

The manufacturer of regenerated fibre or the manufacturer of the dissolving pulp must state the name (species name) of the raw materials used in its production.

The manufacturer of regenerated fibre or the manufacturer of the dissolving pulp must have Chain of Custody certification under the FSC or PEFC schemes.

On an annual basis:

a) At least 50% of the raw materials that are used as cellulose fibre/in the dissolving pulp must be certified as sustainably forested under the FSC or PEFC schemes. The remaining percentage of wood raw materials must be covered by the FSC/PEFC compliance schemes (FSC Controlled Wood/PEFC Controlled Sources)

or

b) At least 70% of the regenerated fibre in the dissolving pulp must be recycled material*

or

c) a combination of certified raw material and recycled material, calculated using the following formula:

Requirement for the percentage of fibre raw material from certified forestry in the pulp (Y): Y (%) ≥ 50 - 0.67 x

where x = percentage of recycled material.

The requirement must be documented as purchased raw material/fibre on an annual basis (volume or weight) by the producer of regenerated fibre or the manufacturer of the dissolving pulp.

Suppliers of dissolving pulp must be specified. If several pulps are mixed, the certification percentage must be met for the finished pulp that is used.

**Recycled material is defined according to ISO 14021, see Definitions.*

- Name (in Latin and one Nordic language) of the raw materials used.
- Valid Chain of custody- certificate from manufacturer of pulp or manufacturer of regenerated cellulose.
- Documentation showing that the requirement for certification or recovered share has been met.

  – Manufacturer of regenerated cellulose must specify supplier (s) of dissolving pulp. The pulp producer must document that the pulp on an annual basis contains a minimum of 50% certified by submitting accounts/overview that show the proportion of certified raw material in production, and that the rest is from controlled sources.

– If the claim is documented by the manufacturer of regenerated cellulose, the supplier (s) of the dissolving pulp must be stated and documentation e.g. invoice or delivery note between pulp producer and producer of regenerated cellulose showing that the purchased pulp contains a minimum of 50% certified raw material. If pulp is purchased from several suppliers, documentation must be submitted on all purchases from the various pulp producers and an account from the producer of regenerated cellulose which shows that the total certified share in the production is at least 50% certified

Background to requirement O113 traceability and certified raw materials

The requirement for certification applies if the regenerated cellulose content in the textile part is more than 50%. See O26 for more information.

O114 Recycled fibres – test for environmentally harmful substances

This requirement applies to all recycled fibres, both synthetic and natural.

– Exemptions: PET bottles that are used in the production of polyester as well as chemically recycled polymers that perform chemical purification are exempt from the requirement.

– Recycled fibres/raw materials for fibre production must not contain the following substances above the limits stated in the table below.

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

Substance/substance group	Max. limit
Metals	
Chromium total	1.0 mg/kg
Lead	0.1 mg/kg
Mercury	0.02 mg/kg
Cadmium	0.1 mg/kg
Antimony	30.0 mg/kg
Organic tin compounds	
TBT and TPhT	0.5 mg/kg
Total of DBT, DMT, DOT, DPhT, DPT, MOT, MMT, MPhT, TeBT, TeET, TCyHT, TMT, TOT, TPT	1.0 mg/kg
Chlorophenols	
Pentachlorophenol	0.05 mg/kg
Tetrachlorophenol	0.05 mg/kg
Trichlorophenol	0.2 mg/kg
Dichlorophenpol	0.5 mg/kg
Monochlorophenol	0.5 mg/kg
Per- and polyfluorinated compounds	
PFOS, PFOSA, PFOSF, N-Me-FOSA, N-Me-FOSE, N-Et-FOSE	Total < 1.0 µg/m2
PFOA	< 1.0 µg/m2
PFHpA, PFNA, PFDA, PFUdA, PFDoA, PFTrDA, PFTeDA	0.05 mg/kg for each
Other stated per- and polyfluorinated compounds as set out in Oeko-Tex 100 Annex 5.	0.05 or 0.5 mg/kg for each as stated in Oeko-Tex 100

Phthalates	
BBP, DBP, DEP, DMP, DEHP, DMEP, DIHP, DHNUP, DCHP, DHxP, DIBP, DIHxP, DIOP, DINP, DIDP, DPrP, DHP, DNOP, DNP, DPP	Total 0.1% by weight
Flame retardants	
Flame retardants, with the exception of flame retardants approved by Oeko-Tex	< 100 mg/kg for each
Formaldehyde	16 mg/kg
Arylamines with carcinogenic properties stated in Oeko-Tex 100 Annex 5	Total 20 mg/kg
Surfactant, wetting agent residues	
Nonylphenol, octylphenol, heptylphenol, pentylphenol	Total 10 mg/kg
Nonylphenol, octylphenol, heptylphenol, pentylphenol, nonylphenol ethoxylate and octylphenol ethoxylate	Total 100 mg/kg
Dyes	
Cleavable, classified as carcinogenic in Oeko-Tex Annex 5	Total 20 mg/kg
Cleavable aniline as listed in Oeko-Tex Annex 5	Total 100 mg/kg
Classified as carcinogenic in Oeko-Tex Annex 5	50 mg/kg
Dyes classified as allergenic in Oeko-Tex Annex 5	50 mg/kg
Other dyes listed in Oeko-Tex Annex 5	50 mg/kg
Pesticides (for recycled natural fibre)	
Pesticides listed in Oeko-Tex 100 Annex 5	Total 0.5 mg/kg

Test methods: as stated in Testing Methods Standard 100 by Oeko-Tex, class I or II.

- Test reports or Oeko-Tex 100 class I or II certificate showing fulfilment of the requirement.
- A written procedure about annual testing in line with the requirement, along with annual in-house checks of compliance with the requirement.

Background to requirement O114 recycled fibres

The requirement is new and corresponds to requirements set in the new criteria for Nordic Ecolabelling of textiles and leather. It is important to consider the potential exposure of the user and the environment to undesirable chemicals from recycled material. The requirement covers the chemical substances and substance groups that are at greatest risk of being present in recycled fibre for textile production. Recycled fibre may contain residues of additives from previously used dyes, pesticides from cultivation, biocides used during transport, and so on[88]. This applies to both fibre recovered from used textiles and fibre recovered from products other than textiles. Even if the textile is washed several times, unwanted chemicals may still be present in the recycled fibre. In mechanical recycling

[88] IKEA and H&M analyze the content of recycled fabrics, article 29-10-2019 on Treehugger.com https://www.treehugger.com/sustainable-fashion/ikea-and-hm-analyze-content-recycled-fabrics.html?utm_source=TreeHugger+Newsletters&utm_campaign=9cd1c025b2-EMAIL_CAMPAIGN_11_16_2018_COPY_01&utm_medium=email&utm_term=0_32de41485d-9cd1c025b2-243762625

processes, all the chemical substances remain in the fibre and may be transferred to the new textile fibre. In the chemical recycling process, some chemical substances remain in the material, and both unproblematic and problematic substances can cause technical interference with the process[89]. It is possible to conduct a spot test for the most relevant substances over a set interval, but since the recycled feedstock may come from multiple sources and can therefore vary a great deal, it is not possible to implement the testing required to identify all the potential “old additives”.

Recycled fibre from PET bottles may also contain small amounts of undesirable substances such as antimony and heavy metals, which are derived from labels, adhesives, printing inks and waste from the transport and sorting of the plastic. However, measurements have established that the levels fall well below the limits set for heavy metals in packaging materials in California’s Toxics in Packaging Prevention Act of 2006[90].

5.11 Quality requirements textiles – seating furniture and headboards

The quality requirements for textiles apply to the following textile parts:

- The cover/upholstery of seating furniture such as sofas, armchairs, chairs, and office chairs
- The cover on headboards
- Upholstered bed frames.

Not all requirements are relevant for all applications. It can e.g. be that the requirements only apply to fabrics that can be removed for washing, or that it does not apply to white fabrics. This is specified in the requirement.

O115 Dimensional changes after washing and drying

The requirement applies to textiles that can be removed and washed.

Dimensional changes after washing and drying must not exceed:

- ± 2% for textiles used in seating furniture

Test procedure to be followed:

- Wash once
- Temperature, washing program and detergent as stated on the care label
- Drying as stated on the care label

Test method:

The tests must be performed in accordance with EN ISO 6330 Textiles – Domestic washing and drying procedures for textile testing, in combination with ISO 5077 Textiles – Determination of dimensional change in washing and drying, or an equivalent standard.

⭱ A test report showing compliance with the requirement.

[89] Nordic Council of Ministers (2016). Gaining benefits from discarded textiles: LCA of different treatment pathways

[90] M. Whitt, Survey of heavy metal contamination in recycled polyethylene terephthalate used for food packaging, Journal of Plastic Film & Sheeting 2012

Background to requirement O115 dimensional changes after washing and drying

The aim of the requirement is to ensure that the textile used in the Nordic Swan Ecolabelled furniture is of high quality. The requirement has changed since the previous version of the criteria and is based on the requirement in the new criteria for the Nordic Swan Ecolabelling of textiles.

O116 Colour fastness to light

The requirement does not apply to white textiles.

Colour fastness to light must be at least level 5.

Level 4 may be permitted if the textile is lightly dyed (standard depth <1/12 in accordance with 105 A06) and consists of mixes containing more than 20% wool or other keratin fibres, or of mixes containing more than 20% flax or other bast fibres.

Tests must be performed in accordance with EN ISO 105 B02 or an equivalent standard.

A test report showing compliance with the requirement.

Background to requirement O116 colour fastness to light

The requirement remains unchanged. The aim of the requirement is to ensure that the colours of a dyed or printed textile are resistant to change (fading) on exposure to light and that the product thus retains its colour for a long time. This requirement therefore ensures the textile has a long lifespan. The requirement does not apply to white textiles or mattresses/mattress covers. The requirement refers to the EN ISO 105 B02 standard.

O117 Colour fastness to washing or dry cleaning

The requirement does not apply to white products, products that are neither dyed nor printed or textiles that are not intended to be washed or dry cleaned.

Colour fastness to washing or dry cleaning must be at least:

- Colour change: level 3–4
- Discolouration: level 3–4

Test method for washing: Tests must be performed in accordance with ISO 105 C06t (a single wash at the temperature stated on the product) or an equivalent standard.

Test method for dry cleaning: The test must be carried out in accordance with ISO 105 D01.

A test report showing compliance with the requirement.

Background to requirement O117 colour fastness to washing or dry cleaning

The requirement is set to ensure high quality and long lifespan for the products. The requirement refers to the ISO 105 C06 standard: Textiles – Tests for colour fastness – Part C06: Colour fastness to household and industrial washing

O118 Colour fastness to rubbing (wet)

The requirement does not apply to white products or products that are neither dyed nor printed.

Colour fastness to wet rubbing must be at least level 3–4.

Tests must be performed in accordance with ISO 105 X12 or an equivalent standard.

T̄ A test report showing compliance with the requirement.

Background to requirement O118 colour fastness to rubbing

The requirement remains unchanged. The requirement is set to ensure that the dye is well-fixed in the textile. If the colour fastness to wet rubbing is good, the other characteristics such as wash resistance and durability will automatically also be good, since wet rubbing in accordance with ISO 105 X12 is a standardised method to control fixing of the dye on the fabric.

The requirement refers to EN ISO 105–X12 Textiles – Tests for colour fastness – Part X12: Colour fastness to rubbing. The scale is given in ISO 105–A03.

This requirement is relevant in relation to the textile's durability, and also to ensure that the dye does not rub off when the product is used.

O119 Colour fastness to rubbing (dry)

The requirement does not apply to white textile products or textile products that are neither dyed nor printed.

Colour fastness to dry rubbing must be at least level 4.

Tests must be performed in accordance with ISO 105 X12 or an equivalent standard.

T̄ A test report showing compliance with the requirement.

Background to requirement O119 colour fastness to rubbing (dry)

The requirement remains unchanged. The requirement is set to ensure that the dye is well-fixed in the textile. If the colour fastness to dry rubbing is good, the other characteristics such as wash resistance and durability will automatically also be good, since dry rubbing in accordance with ISO 105 X12 is a standardised method to control fixing of the dye on the fabric. The requirement refers to EN ISO 105–X12 Textiles – Tests for colour fastness – Part X12: Colour fastness to rubbing. The scale is given in ISO 105–A03.

O120 Wear resistance

Fabric for furniture upholstery (seating) must have the following wear resistance (Martindale):

- For use in domestic environments: 30,000
- For use in non-domestic environments: 50,000
- Furniture upholstery on furniture for non-domestic environments that are marketed for extra hard / hard use: 90,000

Tests must be performed in accordance with EN ISO 12947–2 or an equivalent standard.

- A test report showing compliance with the requirement.

Background to requirement O120 wear resistance

The aim of the requirement is to ensure that the textile has high abrasion resistance in relation to wear and tear. The wear resistance is important for the product life span. The requirement is tightened for textiles for domestic use from 20 000 to 30 000, non-domestic use from 40 000 to 50 000. If the furniture is marketed to extra hard/hard use, the requirement is 90 000. This corresponds to the recommended requirement in public tenders in Denmark.

O121 Pilling – upholstery fabric

Upholstery fabric to seating furniture must have pilling resistance as given in the table below:

Textile type	Requirement level
Domestic use	3–4 (5000 rubs)
Non-domestic use	4 (5000 rubs)
Textiles made of wool or wool mixtures	3–4 (5000 rubs)

Test method: Testing in accordance with EN ISO 12945–2 or an equivalent standard.

- A test report showing compliance with the requirement.

Background to requirement O121 pilling

It is relevant to ensure that pilling does not occur easily on upholstery fabrics to give the product as long a useful life as possible.

5.11.1 Quality requirements coated fabrics

The requirement only applies to coated fabrics and are based on the requirements of EU Ecolabel's criteria for furniture. Back coating is not included here unless the fabric is also surface coated.

O122 Coated fabrics

The quality requirements to coated fabrics are given in the table below:

Property	Requirement	Test method
Tensile strength	CH ≥ 35 daN and TR ≥ 20 daN	ISO 1421
Tear resistance of coated fabrics	CH ≥ 2,5 daN and TR ≥ 2 daN	ISO 13937/2
Colour fastness	≥ 6	EN ISO 105–B02
Abrasion resistance (Martindale method)	≥ 75 000	ISO 5470/2
Determination of coating adhesion	CH ≥ 1,5 daN and TR ≥ 1,5 daN	EN 2411

Where: daN = deca Newtons, CH = Warp and TR = Weft

t̄ A test report showing compliance with the requirement.

5.11.2 Quality requirements mattress covers

O123 Dimensional changes after washing and drying

The requirement applies to textiles that can be removed and washed. Dimensional changes after washing and drying must not exceed:

- ± 3% for woven and ± 5% for non-woven covers.

Test procedure to be followed:

- Wash once
- Temperature, washing program and detergent as stated on the care label
- Drying as stated on the care label

Test method:

The tests must be performed in accordance with EN ISO 6330 Textiles – Domestic washing and drying procedures for textile testing, in combination with ISO 5077 Textiles – Determination of dimensional change in washing and drying, or an equivalent standard.

t̄ A test report showing compliance with the requirement

O124 Mattress covers – mechanical properties

The requirement to mechanical resistance is given in the table below:

Property	Requirement	Test method
Tear strength	Woven fabrics ≥ 15 N Nonwoven fabrics ≥ 20 N Knitted fabrics: not applicable	ISO 13937–2 (woven fabrics) ISO 9073–4 (nonwoven fabrics)
Seam slippage	Woven fabrics ≥ 16 picks: maximum 6 mm Woven fabrics < 16 picks: maximum 10 mm Knitted fabrics and nonwovens: not applicable	ISO 13936–2 (under a load of 60 N for all woven fabrics) or
	As above. The test result should be divided by 2	ISO 13936–2 (under a load of 180 N for all woven fabrics)

	(i.e. result of 12Nm2 – 12/2=6)	
Tensile strength	Woven fabrics ≥ 350 N Knitted fabrics and nonwovens: not applicable	ISO 13934–1

- A test report showing compliance with the requirement.

Background to requirement O122–O124

The requirements for coated materials and quality for mattresses are similar requirements set in the EU Ecolabel's criteria for furniture (2016) and mattresses (2014).

5.11.3 Requirement for other parts of textiles

The requirements for other textile parts are based on testing of the finished textile and essentially correspond to the requirements set in the criteria for Nordic Ecolabelling of baby products with textiles. Several of the requirements can be documented with Oeko-Tex certificate class II, except for requirements for formaldehyde where class I or II is required.

O125 Biocides and antibacterial substances

Chemicals with the following properties must not be added to and/or used in fibres, rolls of fabrics or the textile end-product:

- Antibacterial substances (including silver ions, silver nanoparticles and copper nanoparticles)
- Biocides in the form of pure active substances or as biocidal products.

This requirement also applies to the transport of the textiles.

The ban does not apply to natural antibacterial effect in materials.

Preservation used in chemical raw materials ("in can" preservation is not covered by the ban).

- A declaration of compliance with the requirement from the manufacturer/supplier of textile.

Background to requirement O125 biocides and antibacterial substances

See requirement O102.

O126 Flame retardants

The following flame retardants are prohibited:

- Halogenated flame retardants
- Organophosphate flame retardants

Flame retardants must also meet requirement O127.

- A declaration from the textile manufacturer stating that no halogenated and/or organophosphate flame retardants have been added to textiles or during the production process.
- Documentation in compliance with the requirement O127.

Background to requirement O126 flame retardants

See requirement O103.

O127 Classification of chemical products

Chemical products used in the dyeing process shall not be classified in any of the hazard categories in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372
Sensitising on inhalation or skin contact	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334** H317**

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

*** Non-disperse dyes are exempt from the prohibition of H334 and H317, provided that non-dusting formulations are used or that full or semi-automatic dosing is used. If semi-automatic dosing is used, the manual handling of the dyes must be carried out using the correct personal protective equipment in accordance with safety data sheets (SDS) and/ or the use of technical measures such as local ventilation.*

- Declaration from the textile manufacturer that the requirement is fulfilled.
- For exempted non-disperse dyes: Declaration that non-dusting formulations of these are used or that the requirement to full or semi-automatic dosing is fulfilled.
- Safety data sheet for additives in compliance with current European legislation (Annex II of REACH, Regulation (EC) No. 1907/2006).

Background to requirement O127

See requirement O104.

O128 Extractable metals

Extractable metals must be tested in accordance with: Extraction: EN ISO 105–E04 (perspiration-proof (acidic)). Detection: ICP-MS or ICP-OES.

For the individual textile part, the extractable metals must not exceed the limits in the table below:

Metal	Extractable metal in mg/kg
Antimony (Sb)	30.0 mg/kg
Arsenic (As)	1.0 mg/kg
Cadmium (Cd)	0.1 mg/kg
Chromium (Cr)	2.0 mg/kg
Cobalt (Co)	4.0 mg/kg
Copper (Cu)	50.0 mg/kg
Lead (Pb)	1.0 mg/kg
Nickel (Ni)	4.0 mg/kg
Mercury (Hg)	0.02 mg/kg

- Test report showing that the requirement is fulfilled.
- Alternatively, a certificate for Oeko-Tex 100 class I or II or GOTS version 4 (or later versions) can also be used as documentation.

O129 Total metal content

For the individual textile, the total content of the following metals must not exceed:

- Lead (Pb): 90 mg/kg.
- Cadmium (Cd): 45 mg/kg.

The metal content must be tested in accordance with EPA 3050 B (ICP/MS).

- Test report showing that the requirement is fulfilled.
- Alternatively, a certificate from Oeko-Tex 100 class I or II or GOTS version 4 (or later versions) can also be used as documentation.

Background to requirement O128 and O129

The requirements are made to ensure that the user is not exposed to the effects of hazardous metals from the textile.

O130 Formaldehyde in textile

The amount of free and partly hydrolysable formaldehyde in the finished textile may not exceed 16 ppm for the individual textile element.

Testing must be in accordance with EN ISO 14184–1.

- Test report showing that the requirement is fulfilled, or certificate from Oeko-Tex 100 class I or II or certificate from GOTS version 4 (or later versions), can also be used as documentation.

Background to requirement O130 formaldehyde in textile

The limit values for the permitted amount of formaldehyde in the finished textile are harmonized with the limit level for Nordic Swan Ecolabelled textile. Formaldehyde is classified as harmful to health as a carcinogen and irritant to eyes, throat and skin. Residues of formaldehyde in textiles can often result from post-treatment with anti-curling agents.[91] Oeko-Tex and GOTS have similar requirements for formaldehyde emission. Although test method is different from requirement, certificate from Oeko-Tex Baby and GOTS is accepted as documentation.

O131 Polycyclic aromatic hydrocarbons (PAHs)

For the individual textile element which includes more than 10% by weight synthetic fibre, the sum of the PAHs stated here must be below 10 mg/kg and each individual PAH must be below 1.0 mg/kg.

The requirement concerns the following PAHs:

Substance name	CAS No.	Substance name	CAS No.
Benzo[A]Pyrene	50–32–8	Benzo[A]Pyrene	50–32–8
Benzo[E]Pyrene	192–97–2	Benzo[E]Pyrene	192–97–2
Benzo[A]Anthracene	56–55–3	Acenaphthylene	208–96–8
Dibenzo[A,H]Anthracene	53–70–3	Acenaphthene	83–32–9
Benzo[B]Fluoranthene	53–70–3	Anthracene	120–12–7
Benzo[J]Fluoranthene	205–82–3	Fluorene	86–73–7
Benzo[K]Fluoranthene	207–08–9	Naphthaline	91–20–3
Chrysene	218–01–9	Phenanthrene	85–01–8
Benzo[ghi]perylene	191–24–2	Fluoranthene	206–44–0
Indeno[1,2,3-cd]pyrene	193–39–5	Pyrene	129–00–0
Benzo[A]Pyrene	50–32–8	Benzo[A]Pyrene	50–32–8
Indeno[1,2,3-cd]pyrene	193–39–5	Pyrene	129–00–0

Must be tested in accordance with ISO 18287 or ZEK 01.2–08 (GC/MS).

† Test report showing that the requirement is fulfilled. A certificate from Oeko-Tex 100 class I or II can also be used as documentation.

Background to requirements O131 PAHs

There are more than 100 PAH compounds. Several of the PAHs are carcinogenic with Carc.1B and genotoxic. The PAHs usually originate from two types of additives, which are plasticising and process oils (extender oils) and carbon black. Plasticising and process oil is a mineral oil product which originates from crude oil (petrogenic PAHs), while carbon black is a product that is produced by incomplete incineration or thermal degradation processes for heavy oils, such as coal tar (primarily pyrogenic PAHs). Carbon black is used as a dye, for example. The requirement is harmonized with the levels in Oeko-Tex 100 standard class II.

[91] Folkehelseinstiuttet, Norwegian Institute of Public Health: http://www.fhi.no/eway/default.aspx?pid=233&trg=MainLeft_6039&MainArea_5661=6039:0:15,4521:1:0:0:::0:0&MainLeft_6039=6041:70095::1:6043:3:::0:0 (available 26.11.2011)

O132 Pesticides in cotton and other natural seed fibres of cellulose, as well as flax, bamboo or other bast fibres

Textile elements of 100% organic fibre are exempt from the requirement.

The requirement concerns textile elements which include cotton or other natural seed fibres of cellulose, and flax, bamboo or other bast fibres.

The total sum of pesticides in the individual textile element may not exceed 1.0 mg/kg.

The pesticides to be tested for are:

- Aldrin, captafol, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, hexachlorocyclohexane (total isomers), 2,4,5-T, chlordimeform, chlorobenzilate, dinoseb with salts, monocrotophos, pentachlorophenol, toxaphene, methamidophos, methyl parathion, parathion, phosphamidon, gluphosinate and glyphosate.

The content must be tested in accordance with Section 64 LFGB L 00.0034 (GC/MS); Section 64 LFGB L 00.00–114 (LC/MS/MS) or equivalent EN test standards (assessed by a test institute or Nordic Swan Ecolabelling).

- Test report showing fulfilment of the requirement, or valid certificate showing that the fibres are organic.
- A certificate from Oeko-Tex 100 class I or II or GOTS version 4 (or later versions) can also be used as documentation.

O133 Ectoparasiticides in wool and other keratin fibres

The requirement concerns textile elements that include wool or other keratin fibres, in any amount.

Textile elements of 100% organic wool fibres, or which have documented that the textile element fulfils requirement O108, are exempt from this requirement.

The total sum of ectoparasiticides in the individual textile element may not exceed 1.0 mg/kg.

The ectoparasiticides to be tested for are:

- γ-hexachlorocyclohexane (lindan), α-hexachlorocyclohexane, β-hexachlorocyclohexane, δ-hexachlorocyclohexane, aldrin, dieldrin, endrin, p,p'-DDT and p,p'-DDD, cypermethrin, deltamethrin, fenvalerate, cyhalothrin, flumethrin, diazinon, propetamphos, chlorfenvinphos, dichlorphenthion, chlorpyriphos, phenchlorphos, diflubenzuron and triflumuron.

The content must be tested in accordance with Section 64 LFGB L 00.0034 (GC/MS); Section 64 LFGB L 00.00–114 (LC/MS/MS).

- Test report showing fulfilment of the requirement, or valid certificate showing that the fibres are organic.
- Certificate from Oeko-Tex 100 class I or II or GOTS version 4 (or later versions) can also be used as documentation.

Background to requirements O132 pesticides and O133 ectoparasiticides in wool

Since it is possible to use a combination of organic, IPM and conventional cotton, or organic or conventional wool, it is assessed that for this product group, where the textile is not

washed, it is relevant to ensure a minimum content of pesticides in the finished textile. The requirements are the same as in the criteria for Swan labelling of baby products with textiles.

5.12 Padding materials

Padding material to which requirements are set and can be included in a Nordic Swan Ecolabelled furniture are polyurethane foam (PUR), polyester fibre, synthetic latex, recycled textile waste and natural padding materials, such as natural latex, coir (coconut fibre), straw, down and feathers. The first requirements in the chapter apply to all padding materials. The additional requirements given later in the chapter apply to certain types of padding materials.

Padding materials evaluated for compliance with the Nordic Swan Ecolabel's criteria for Textiles, hides and leather, generation 5 or later or the EU Ecolabel criteria for Bed mattresses, version 2014 or later already meet the requirements in this section. Only the name, manufacturer and licence number of the licence that includes the padding material need to be submitted.

5.12.1 Material requirements

O134 Recycled padding materials

Recycled padding materials must not contain halogenated flame retardants.

Recycled padding material (both foam and other natural padding materials such as down and feathers) must meet the requirements for substances specified in Annexes 4 and 5 of the Oeko-Tex 100 standard class II.

Test methods as specified in Testing Methods Standard 100 by Oeko-Tex.

Any additives to the recycled padding material must comply with O139.

Recycled material is defined according to ISO 14021, see definitions.

- Documentation showing that the material is recycled in compliance with ISO14021.
- A declaration from the supplier of the recycled padding material that it does not contain halogenated flame retardants.
- Test reports or Oeko-Tex 100 class II certificate showing that the requirement is fulfilled

Background to requirement O134 recycled padding materials

The requirement is new. Nordic Ecolabelling is positive towards the use of recycled materials. However, Nordic Swan Ecolabelled products should not contain materials with halogenated flame retardants. In addition, the padding material shall be tested for relevant substances specified in Annexes 4 and 5 of the Oeko-Tex 100 standard and meet the limit values for class II. Testing requirements are set to limit unwanted chemicals in recycled padding materials.

O135 Renewable padding materials

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

The renewable raw materials must either:

- Be residual products from other production processes, e.g. straw from grain production or
- Meet the relevant requirements for fibre given in Chapter 5.10.3

- Name and geographic origin of the renewable raw materials.
- A description of the raw material showing that it is a residual product or documentation in compliance with the relevant requirement in Chapter 5.10.3

Background to requirement O135 renewable padding materials

The requirement is new. Nordic Ecolabelling is positive towards the use of renewable padding materials. However, information about which species are used and where the raw materials originate from is wanted. The renewable raw materials must either be residual products from another production process, e.g. straw from grain production or must meet the relevant requirements for fibre given in the chapter on textiles. This applies to requirements for cotton, linen and other bast fibres, wool and other keratin fibres.

O136 Ethical requirements for feathers and down

The use of feathers and down plucked from live birds is prohibited.

Force feeding the birds is prohibited.

Recycled* down and feathers are exempt from the requirement, but it must be documented through a traceability system that the down and feathers are recycled.

**Recycled down and feathers are defined here as post-consumer recycled material in accordance with the ISO 14021 standard.*

- A Responsible Down Standard certificate or a certificate from another relevant standard that fulfils the requirement.
- Recycled down and feathers: Recycled Global Standard certificate, version 4 or later. Or documentation from a supplier of recycled down or feathers showing that it is a post-consumer recycled material.

Background to requirement O136 ethical requirements for feathers and down

This is a new requirement and is the same requirement that is set in the criteria for Textiles, hides/skins and leather Version 5. It is mainly geese that are live plucked for feathers and down, although other species are live plucked too. Plucking feathers and down from live geese is banned in the EU, but an investigation by the European Food and Safety Authority (EFSA) has established that it is possible to pluck down and feathers from live geese during the moulting period. EFSA has recommended setting up a control system for this. Since no such control system is currently in place, Nordic Ecolabelling makes the requirement that plucking down and feathers from live birds is prohibited. A requirement has also been made that force feeding is prohibited.

Textile Exchange has issued a standard for down and feathers. Certification under this standard, the Responsible Down Standard (RDS), is possible. The RDS requires independent, third party assessments of key aspects of animal rearing and handling and ensures traceability all the way through the supply chain. The goal of the Responsible Down Standard is to ensure that down and feathers do not come from birds that have been subjected to any unnecessary harm. The standard may apply to both blended and 100% certified products. However, final products may only be labelled as RDS certified if the down or feathers in them are 100% certified. The standard certifies that birds have not been force fed nor live plucked. There are many certified providers of down and feathers and these are used for a wide range of products in the market.

O137 Manufacture of polyurethane foam

CFC, HCFC, HFC, methylene chloride or other halogenated organic compounds must not be used as blowing agents.
Protective measures must be taken when handling isocyanates to reduce employee exposure as far as possible. The Workplace Exposure Limits for air* concentrations of isocyanates in areas where employees are working without protective equipment are:

- MDI (CAS No. 101–68–8): Average over an 8-hour period must not exceed 0.005 ppm (0.05 mg/m3)
- TDI (CAS No. 584–84–9 and 91–08–7): Average over an 8-hour period must not exceed 0.005 ppm (0.04 mg/m3)

**If the legislation in the individual country has lower limit values than stated in the requirement, it is the limit values of the legislation that must be met.*

- A declaration from the manufacturer of padding materials stating which blowing agent has been used.
- A description of the safety measures taken and the statutory Workplace Exposure Limits for isocyanates in the country of manufacture. If the statutory limits are the same or more stringent than the threshold limit values in the requirement, no further documentation is required. If the statutory limits are less stringent, a description of how air concentration levels of isocyanates are measured must be submitted, along with a test report showing compliance with the threshold limit values specified in the requirement.

O138 Content of butadiene in synthetic latex

The content of butadiene in synthetic latex must be less than 1 mg/kg (ppm).
Gas chromatography with flame ionisation detection must be used to determine the concentration. Before the analysis is performed, the latex foam must be ground and weighed, and the sample placed in a headspace vial.

- A test report from the latex manufacturer showing that the requirement is fulfilled.

Background to requirement O138 butadiene in synthetic latex

The requirement remains unchanged. Several synthetic latex materials are made of substances that are hazardous to the environment and human health, for example substances that are suspected to cause cancer. One substance that acts as a monomer in the production of latex is 1,3-butadiene (CAS No. 106–99–0) which has H340 and H350

CMR classifications. There is therefore a requirement for content of butadiene to be tested to ensure that the monomer content of the final latex is low.

5.12.2 Chemical requirements – padding materials

O139 Chemicals used in the production/treatment of padding materials

The following substances shall not be an ingoing substance (see Definitions) in chemical products used in the production or treatment of padding materials:

- Substances on the Candidate List*
    - The following applies to the siloxanes D4, D5 and D6: D4 (CAS No. 556–67–2), D5 (CAS No. 541–02–6) or D6 (CAS No. 540–97–6) must only be included in the form of residues from raw material production and is permitted for each in quantities up to 1000 ppm in the silicone raw material (chemical).
- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Halogenated organic compounds. Exemptions** for:
    - Adhesives containing polychloroprene for production of mattresses and upholstered furniture if the emission of the rest monomer chloroprene (2-chloro-1,3butadiene) is ≤ 1 µg/m3 after 3 days, measured with the chamber method EN ISO 16000 or equivalent methods. The exception is not valid for mattresses designed for children.

*** Perfluorinated and Polyfluorinated alkyl substances are covered by their own bullet and are not included in the exemption.*

- Organophosphate flame retardants***
- Substances classified as carcinogenic in categories 1A/1B/2 (H350, H351), mutagenic in categories 1A/1B/2 (H340, H341) or reprotoxic in categories 1A/1B/2/Lact (H360, H361, H362) according to the CLP Regulation 1272/2008. Exemptions for:
    - 1,3-butadiene (CAS No. 106–99–0) that is used in the manufacture of synthetic latex from the classifications H340 and H350 if subsequent requirements regarding residual monomers are met, see O144
    - formaldehyde (CAS No. 50–00–0) from the classification H350 if subsequent requirements regarding emissions are met, see O147
    - methylene diphenyl diisocyanate (MDI) and toluene diisocyanate (TDI) in the production of polyurethane foam if requirement O143 is met.
    - tin octoate (CAS No. 301–10–0) when used as a catalyst in the production of polyurethane foam
- Phthalates
- Organotin compounds
- Biocides or biocide products that are added to the padding material for a disinfecting or antibacterial purpose

**The Candidate list can be found here: https://echa.europa.eu/candidate-list-table*

****Exemption can be granted in specific cases where it can be documented that the furniture is to be sold on a market where regulatory requirements on fire safety demands testing with «open flame test» (EN 597–2 or equivalent). The flame retardant must meet O105. Please*

note that furniture with organophosphate flame retardants can be sold as Nordic Swan Ecolabelled only on the specific market and to the specific area of use where these regulatory requirements apply.

- A declaration from the manufacturer of padding material.
- For natural padding materials without chemical additives or treatments: A declaration from the supplier that verifies this.
- If the exemption is used: Documentation from the furniture manufacturer which shows that the regulatory requirements for fire safety require testing in accordance with EN 597–2 or an equivalent test.
- If the exemption is used: The furniture manufacturer must state area of use, and in which markets the product with organophosphate flame retardants is sold and have a routine that ensures that the conditions in the exemption are met.

Background to requirement O139 chemicals used in production of padding materials

The requirement was also included in the previous version of the criteria but was then referred to as chemical additives. The requirement has been perceived as unclear concerning which chemical additives are covered by the requirement and how far back in the manufacturing chain the requirement goes. An attempt has therefore been made to clarify that the requirement applies to all chemical products used in the manufacture or treatment of padding materials.

The products that are not chemically hardened and monomers that are used in the manufacture of padding materials can, for example, have classifications that do not meet the requirement that Nordic Ecolabelling normally makes for prohibited classifications. In its finished form, the padding material has other properties, and it has therefore been considered most relevant to make the requirement that a number of specific substances must not be used in the manufacturing or treatment processes.

1,3-butadiene and formaldehyde are exempt from the ban on substances classified in CMR categories 1A/1B provided they meet subsequent requirements concerning residual monomers and emissions respectively. The substances have been exempted as they are necessary for use in the manufacture of certain types of stuffing materials.

The requirement also prohibits substances that are classified CMR category 2, which is new compared to generation 4 of the criteria. The isocyanates methylene diphenyl diisocyanate (MDI) and toluene diisocyanate (TDI) and tin octoate (CAS No. 301–10–0) are excluded as they are necessary for use in the manufacture of polyurethane foam. MDI and TDI are not specified with CAS numbers as there are several different isomers that have different numbers. All different varieties have the same environmental and health properties and are covered by the exemption. Tin octoate is used as a polymerization catalyst and is the most common catalyst to use. The only alternative available today is organotin compounds, which is also not allowed according to the requirement and is not a better alternative from an environmental and health point of view.

Different types of padding materials may contain halogenated flame retardants. However, as they have limited biodegradability and are associated with adverse effects on the environment and human health, halogenated flame retardants are banned A ban is also placed on organophosphate flame retardants.

Organotin compounds are used as catalysts for the formation of polyurethane foam. Disubstituted organotin compounds are normally used, such as dibutyltin (DBT) and dioctyltin (DOT). These are highly toxic to the environment and a hazard to human health and are considered endocrine disruptors[92].

O140 Dyes

Dyes may only be added to padding materials to distinguish between different qualities (e.g. hard and soft foam) within the same type of filling.
Metal complex dyes that have a classification in the table below must not be used.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2	H400 H410 H411
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372

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

- A declaration from the manufacturer of the padding material that no dyes have been added or have only been added for the purpose of distinguishing between different qualities.
- Safety data sheet in accordance with Appendix II of REACH (Regulation No. (EC) 1907/2006) for any added dyes.

Background to requirement O140 dyes

The requirement is the same as in the previous version of the criteria, except that the exemption permitting the use of the dye now only applies for the purpose of distinguishing between different qualities. Previously, an exemption was also made for padding materials that are visible and will be used without a cover. This has been deleted because it is unusual that padding materials are used that way and that this needs to be declared by the furniture

[92] Tüv Süd, Technical guidance on organotin compounds: https://www.tuvsud.com/en/e-ssentials-newsletter/past-topics/technical-guidance-on-organotin-compounds (downloaded 17 October 2019)

manufacturer while other parts of the requirement are declared by the manufacturer of the padding materials.

5.12.3 Requirements for emissions

O141 Requirements for emissions – foam padding materials

Foam padding materials, such as polyurethane foam and latex foam, must meet the requirements for emissions in the table below. Emissions testing must be carried out in compliance with EN 16516 or equivalent test methods.

Substance or substance group	Threshold limit value (mg/m^3)
Formaldehyde (CAS No. 50–00–0)	0.1
Toluene (CAS No. 108–88–3)	0.1
Styrene (CAS No. 100–42–5)	0.005
4-4-Vinylcyclohexene (CAS No. 100–40–3)	0.002
4-Phenylcyclohexene (CAS No. 4994–16–5)	0.03
Vinyl chloride (CAS No. 75–01–4)	0.002
Volatile aromatic hydrocarbons (VAH)	0.3
Volatile organic compounds (VOC)	0.5

- A test report showing that the threshold limit values in the requirement have been met.
- Alternatively, an Oeko-Tex Standard 100 certificate (all classes) or CertiPUR certificate can be used as documentation for the requirement.

Background to requirement O141 emissions – foam padding materials

The previous Version 4 of the criteria made the requirement that the concentration or emission of formaldehyde must be tested if it has been used in the manufacture of the padding material. This has been amended to require testing of emissions for additional substances and substance groups and not just for formaldehyde. Emissions testing must be carried out for foam padding materials, such as polyurethane foam and latex foam. Foam padding materials can contain and emit volatile organic compounds found as residues from the production of polymers. Foam padding materials are frequently used in beds, sofas and other items of furniture that come into close contact with the user. Tests must therefore be carried out to ensure low emissions from the padding materials. Latex foam must also meet subsequent requirements for the content of butadiene and emissions of N-Nitrosamines.

Several other labelling bodies set requirements for emissions of the same substances and substance groups, e.g. Oeko-Tex Standard 100, CertiPUR and the EU Ecolabel criteria for bed mattresses and furniture. To allow greater flexibility in the requirement, certificates from Oeko-Tex or CertiPUR are accepted as documentation. Padding materials that have been inspected in accordance with the EU Ecolabel criteria automatically meet the requirement. Oeko-Tex has the same threshold limit values as in the requirement and the threshold limit values are the same for all the different Oeko-Tex classes. Certificates from all the Oeko-Tex classes (class I, II, III and IV) are therefore accepted as documentation. The threshold limit values are slightly different for CertiPUR, for example, in the case of styrene and aromatic

hydrocarbon emissions. Nonetheless, a certificate from CertiPUR has still been considered sufficient to meet the requirement, since their threshold limit values are also low.

O142 N-nitrosamines in latex

If accelerators that form N-nitrosamines* have been used in the manufacture of latex, emissions must not exceed 0.0005 mg/m3 in compliance with EN 16516 or equivalent test methods.

The requirement applies to both natural latex and synthetic latex.

**n-nitrosodimethylamine (NDMA), n-nitrosodiethylamine (NDEA), n-nitrosomethylethylamine (NMEA), nnitrosodi-i-propylamine (NDIPA), n-nitrosodi-n-propylamine (NDPA), n-nitrosodi-n-butylamine (NDBA), nnitrosopyrrolidinone (NPYR), n-nitrosopiperidine (NPIP), n-nitrosomorpholine (NMOR)*

- A declaration from the latex manufacturer that no accelerators that form N-nitrosamines have been used, or a test report showing that the threshold limit value has been met.

Background to requirement O142 N-nitrosamines in latex

The requirement remains unchanged, but the test method has been changed to harmonise with Version 5 of Nordic Swan Ecolabelling of Textiles, hides/skins and leather, and with the EU Ecolabel criteria for furniture.

Accelerators used for vulcanisation of latex can emit nitrosamines during the production process. Several N-nitrosamines tested in animal experiments have been found to be carcinogenic. It is possible to use accelerators that do not form nitrosamines, but the choice of accelerator can be influenced by technical difficulties or cost[93]. If accelerators that form N-nitrosamines are used in the manufacture of latex, an emissions test is required to ensure that the majority emitted during production will not be emitted during use.

5.13 Hide and leather

There are different sets of requirements for hide and leather depending on the amount contained in the product and the function. The most comprehensive requirements are set to hide and leather which are covers, e.g. covers on sofas and chairs. Hide and leather used as such covers are included in a relatively large amount and also come into contact with skin. Hide and leather previously had to comply with all the requirements specified in the criteria for the Nordic Swan Ecolabelling of textiles, hide and leather. Requirements are set for leather and leather that is included with more than 1% by weight in the product.

Many of the requirements in this chapter are harmonized or partially harmonized with the requirements set out in the criteria for Nordic Ecolabelling of textiles, leather and leather. Reference is therefore made to the background document for these criteria for a more general background to the requirements.

[93] European Ecolabel Bed Mattresses, LCA and criteria proposals final report for the EC, accessed 18 June 2019 http://ec.europa.eu/environment/ecolabel/documents/bed_mattresses_report.pdf

5.13.1 Requirements for hide and leather regardless of the amount in the product

O143 Chromium in hide and leather

The extractable chromium content of the finished leather or hide (including finishing) must be less than 200 mg / kg (mass of chromium (total) / dry weight of leather or hide) according to EN ISO 17072–1.

Processed hide or leather (including finishing) must not contain chromium VI in compliance with EN ISO 17075 (detection limit 3 ppm) or equivalent.

- A test report showing compliance with the requirement for total chromium and chromium VI.

Background to requirement O143 chromium in hide and leather

The requirement is the same as that proposed in the revised criteria for the Nordic Swan Ecolabelling of textiles. The requirement limit of 200 mg / kg mass of chromium (total) / dry weight corresponds to the requirement limit in Blue Angel and EU Ecolabel.

In the EU, there is a REACH restriction that leather parts that come into contact with the skin must not contain chromium (VI) with 3 mg / kg (3 ppm) or more. The standard EN ISO 17075 recommends a detection limit of 3 ppm. The requirement here in the criteria goes beyond legal requirements by requiring and checking the test report.

Release of Cr (VI) compounds is a problem as hexavalent chromium compounds are contact allergens. Cr (VI) is one of the most well-known allergens. Therefore, this requirement is set for all leather and hide that is included to reduce the risk of allergic reactions.

Hexavalent chromium (Cr (VI)) is not used in the tanning industry and has no effect in the tanning process. However, chromium (III) salts can – under certain conditions – be converted to Cr (VI) compounds.[94] The requirement does not exclude chromium tanning (chromium III) but requires a minimum content of extractable total chromium in the finished leather. 80 – 90% of skin and leather production worldwide uses chromium (III) salts in their tanning processes and there are qualities that cannot be achieved with alternative tanning agents. This is described in the EU's Best Available Techniques (BAT) reference document for skins and leather and explains which states this as the reason for the limited substitution of chrome tanning with alternative substances. At the same time, today it is possible to minimize the extractable content of chromium in the finished product.

Regardless of which tanning process is used, it is relevant to ensure that the content of chromium and especially chromium (VI) in the finished leather is documented and low. The requirement must thus be documented regardless of the tanning process. The EU's Best Available Techniques (BAT) reference document for hides and skins[95] does not specify a specific tanning process as BAT. Each process has different important environmental and health aspects, and the choice of tanning technology depends mainly on the properties

[94] Investigation and health related assessment (allergy only) of chromium in leather shoes
[95] Best Available Techniques (BAT) Reference Document for the Tanning of Hides and Skins, JOINT RESEARCH CENTRE 2013

needed in the finished material, the cost, available production facilities and the type of raw material treated.

O144 Cadmium and lead

Cadmium and lead shall not be found in processed hides/skins or leather.

The content of cadmium and lead shall be tested according to the methods AAS, ICP-OES or ICP-MS (detection limit 10 ppm).

- A test report from the tannery showing that the requirement is fulfilled.

Background to requirement O144 cadmium and lead

The requirement is set to ensure that there is no cadmium and lead in the finished hides/skins or leather. Lead occurs most often due to contaminants in the chromate during chromium tanning.

O145 Biocides and antibacterial substances

The addition and/or integration of substances that may have a biocidal and/or antibacterial effect into hides/skins or leather is not permitted. This includes chemicals with the following properties:

- Antibacterial substances (including silver ions, silver nanoparticles and copper nanoparticles)
- Biocides in the form of pure active substances or as biocidal products

The requirement also applies during the storage and transport of hides/skins and leather.

Exemption is given for the use of biocidal active substances in the actual tanning process if the active substance is permitted for leather and hide in EU Regulation (EU) no. 528/2012.

Biocides/antibacterial substances include silver compounds, organotin compounds, chlorophenols, nano silver and nanogold.

- Declaration from the producer of the hide/skin or leather that the requirement is fulfilled.
- When using the exemption, a list of the biocidal active substances used must also be submitted.

Background to requirement O145 biocides and antibacterial substances

Biocides may be used in various tanning processes to protect the substrate against microbial attack. The requirement does not include the use of salt as a preservative. See also background to O102.

5.13.2 Requirements for hide and leather – covers

O146 Classification of chemicals

The chemicals used must not be classified in any of the hazard categories set out in the table below. The requirement applies to all chemicals used in every step of manufacturing leather and hides/skins (including finishing).

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Ozone	H400 H410 H411 H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction1*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SE 1 STOT RE 1	H370 H372
Sensitising on inhalation or skin contact	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334** H317**

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

Exceptions are granted for the use of biocidal active substances in the actual tanning process, if the active substance is permitted for leather and leather in EU Regulation (EU) no. 528/2012.

***Non-disperse dyes are exempt from the prohibition of H334 and H317, provided that non-dusting formulations are used or that full or semi-automatic dosing is used. If semi-automatic dosing is used, the manual handling of the dyes must be carried out using the correct personal protective equipment in accordance with safety data sheets (SDS) and/ or the use of technical measures such as local ventilation.*

- Declaration from the chemical manufacturer that the requirement is fulfilled.
- When using the exemption, a list of the biocidal active substances used must be submitted.
- For exempted non-disperse dyes: Declaration that non-dusting formulations of these are used or that the requirement to full or semi-automatic dosing is fulfilled.

Background to requirements O146 classification of chemicals

The requirement applies to all chemicals used in the production of hide and leather to ensure there is a focus on this in all processes where chemicals are used. Nordic Ecolabelling seeks to ensure that the health and environmental impacts of the products are as low as possible. Therefore, requirements are set with a ban on e.g. CMR classification. In addition to chemistry for the tanning process itself, chemicals such as dyes, auxiliary chemicals, finishing chemicals, solvents, enzymes, biocides and various inorganic standard chemicals are also used. The amount of chemicals used varies considerably depending on the type of

leather product and the process chosen. The commonly used inorganic chemicals are sodium sulphide, calcium hydroxide, acids, carbonates, sulphites, and sulphates. The largest variation is in the amount of tanning agent used.[96]

An exception has been inserted here for biocidal active substances, which are permitted for skins and leather in EU Regulation (EU) No. 528/2012, as the very purpose of tanning is to prevent skins and leather from rotting due to microbial infestation. There is therefore a need for treatment with an antibacterial effect.

O147 Classification of ingoing substances in chemical products

Chemical products must not contain any ingoing substances (see definitions) that have any of the classifications stated in the table below. The requirement applies to all chemicals used in every step of manufacturing leather and hides/skins (including finishing).

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362

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

Exemption:

Titanium dioxide (TiO2) in powder form is exempt from the requirement.

t̄ Declaration from the chemical manufacturer that the requirement is fulfilled.

Background to requirement O147 classification of ingoing substances in chemical products

The requirement is new and has been harmonised with the requirements to chemicals in the revised criteria for the Nordic Swan Ecolabelling of textiles, hide and leather. Nordic Ecolabelling seeks to ensure that the health and environmental impacts of the products are as low as possible. A ban on substances with CMR classification has therefore been set as a requirement, which thus excludes some of the substances identified as having serious effects on human health.

O148 Prohibited substances

The following substances must not be present as an ingoing substance (see definitions) in chemical products used to produce hides/skins and leather. The requirement applies to all chemicals used in every step of manufacturing leather and hides/skins (including finishing).

- Substances on the Candidate List*

[96] Best Available Techniques (BAT) Reference Document for the Tanning of Hides and Skins, JOINT RESEARCH CENTRE 2013

    - The following applies to the siloxanes D4, D5 and D6: D4 (CAS No. 556–67–2), D5 (CAS No. 541–02–6) or D6 (CAS No. 540–97–6) must only be included in the form of residues from raw material production and is permitted for each in quantities up to 1000 ppm in the silicone raw material (chemical).
- Substances that are PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative) as set out in the criteria of REACH Annex XIII
- Endocrine disruptors: Substances on the EU member state initiative "Endocrine Disruptor Lists", List I, List II and III, see the following links:
    - List I: https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - List II: https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
    - List III: https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sub lists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sub list II which were evaluated under a regulation or directive which doesn't 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 on sub list II.

- Flame retardants (e.g. short chain chloroparaffins)
- Perfluorinated and polyfluorinated alkylated substances (PFAS)
- Nanoparticles**
- Heavy metals in dyes and pigments ***
- Azo dyes that may release carcinogenic aromatic amines (see Appendix 5)
- Phthalates
- Organotin compounds
- Chlorinated solvents, including chlorophenols and chlorobenzenes
- Alkylphenols, alkylphenol ethoxylates (APEO) and other alkylphenol derivates****
- Linear alkylbenzene sulphonates (LAS)
- Aziridines and polyaziridines
- EDTA (ethylene diamine tetraacetic acid) and DTPA (diethylene triamine pentaacetate)

**The Candidate List can be found here: (https://echa.europa.eu/candidate-list-table)*

***An exemption is made for pigments.*

**** Exemptions from the requirement are granted for metal impurities in dyes and pigments up to the amounts set out in ETAD, Annex 2 "Heavy metal limits for dyes": antimony (50 ppm), arsenic (50 ppm), cadmium (20 ppm), chromium (100 ppm), lead (100 ppm), mercury (4 ppm), zinc (1500 ppm), copper (250 ppm), nickel (200 ppm), tin (250 ppm), barium (100 ppm), cobalt (500 ppm), iron (2500 ppm), manganese (1000 ppm), selenium (20 ppm) and silver (100 ppm).*

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

- Declaration from the chemical manufacturer or chemical supplier that the requirement is fulfilled.

Background to requirement O148 prohibited substances

There used to be a similar requirement for auxiliary chemicals used in dyeing and finishing processes. The requirement now applies to all chemicals. The requirement is harmonised with corresponding requirements in the new criteria for the Nordic Swan Ecolabelling of textiles, hide and leather.

O149 Sources of hides, skins and leather

Only skins and hides from the following animals can be used: fish*, sheep, goats, cattle, horses, pigs, elk, deer and reindeer.

**Skin from fish on the IUCN Redlist is not allowed.*

- The applicant must provide a declaration from the leather manufacturer or leather supplier that the hides/skins used have come from animals farmed for production of milk, wool and/or meat/fish.

Background to requirement O149 sources of hides, skins and leather

The requirement is new and is consistent with requirements in the new criteria for the Nordic Swan Ecolabelling of textiles, hide and leather. The aim of the requirement is to ensure that only hides that are a by-product of the meat/dairy/wool industries are used. This mitigates the environmental impact of livestock, and it makes sense from an ethical point of view that the leather and hides produced are derived from a by-product of the meat/dairy/wool industries. Fish skin provided it is not on the IUCN Redlist[97], is now also included in this version of the criteria. Fish skin must comply with the same requirements as other types of skin and leather.

5.13.3 Quality requirements for hide and leather

O150 Tear strength for leather

Tear strength must be more than 20 N. Testing must be performed in accordance with ISO 3377 or equivalent.

- Test report showing that the requirement is fulfilled.

Background to requirement O150 quality – hide and leather

The requirement has been set to ensure the good quality of the leather, in terms of strength. The requirement refers to the standard ISO 3377–1 “Leather – Physical and mechanical tests – Determination of tear load – Part 1: Single edge tear”. The requirement remains unchanged from the previous generation.

[97] The IUCN Redlist: https://www.iucnredlist.org/

O151 Flexing test

The requirement only applies to leather with a surface coating.

When testing leather's flexing resistance, the leather must manage 20,000 test repetitions (20 kc) without sustaining visible damage.

The test must be performed in accordance with ISO 5402 or equivalent.

t̄ Test report showing that the requirement is fulfilled.

Background to requirement O151 flexing test

The requirement has been set to ensure the good quality of the leather, in terms of its flexing resistance and how the surface finish is affected. The requirement refers to the standard ISO 5402 "Determination of flex resistance".

O152 Colour fastness to water

The requirement applies to leather that has been dyed or surface-coated.

Colour fastness when exposed to water must be at least level 3 for leather that is dyed or has a surface finish.

The test must be performed in accordance with ISO 11642 or equivalent.

t̄ Test report showing that the requirement is fulfilled.

Background to requirement O152 colour fastness to water

The requirement has been set to increase possibility of a long lifetime by requiring that dyed or finished leather has high colour fastness and low cross-staining when wet. The requirement refers to the standard ISO 11642 "Leather – Tests for colour fastness – Colour fastness to water".

O153 Colour fastness to wear

Colour fastness during wet and dry wear must be at least level 3 for leather that is dyed or has a surface finish.

For vegetable tanned leather where no finishing is done, colour fastness is accepted for wet and dry wear of at least 2.

The test must be performed in accordance with ISO 11640 or equivalent, with 20 repetitions for wet wear and 50 repetitions for dry wear. The results are to be assessed using ISO 105–A02 and ISO 105–A03 or equivalent.

t̄ Test report showing that the requirement is fulfilled.

Background to requirement O153 colour fastness to wear

The requirement has been set to increase possibility of a long lifetime, by requiring that dyed or finished leather has high colour fastness during wear. The test describes how the surface of the leather is affected by dry and wet rubbing. ISO 11640: "Leather – Tests for colour fastness – Colour fastness to cycles of to-and-fro rubbing".

5.14 Materials for sound absorption

Fibre products that are made, for example, from polyester and recycled textile waste and are used as sound absorption material must meet the relevant requirements for padding materials in Chapter 5.12. Textiles that are used to cover the sound absorption material must meet the relevant requirements for textile.

Mineral raw materials that are used for acoustic insulation, for example in a partition wall, and make up more than 5% by weight of the finished furniture product, must meet the requirement in this chapter.

O154 Mineral raw materials for acoustic insulation

The mineral raw materials used must meet relevant requirements set in the Nordic Ecolabel criteria for Construction and facade panels generation 6 or later.

Mineral raw materials that have been examined and are included as material in a license for Nordic Swan Ecolabelled acoustic panels in accordance with the criteria for Construction and facade panels generation 6 or later automatically meet the requirement.

- Documentation in accordance with the requirements in the criteria for Construction and facade panels, generation 6 or later.
- Name, manufacturer, and licence number for the Nordic Swan Ecolabelled acoustic panel where the mineral raw materials are included.

Background to requirement O154 mineral raw materials for acoustic insulation

Mineral raw materials may be included as a material in furniture, for example, as acoustic insulation material in a partition wall. The requirement is unchanged. It would be complicated to place a requirement for mineral raw materials in the criteria for furniture, so instead there is now a requirement that the raw materials must be inspected in compliance with the Nordic Swan Ecolabel's criteria for Construction and facade panels. Other soundproofing materials must meet relevant requirements in the chapter on padding materials.

5.15 Glass

The requirements in this section apply to glass that makes up more than 5% by weight in the finished furniture/fitment. The requirements do not apply to smaller parts such as electrical components, displays and fibreglass used as reinforcement for plastic. Requirement O157 for recycled glass applies to glass that is included with more than 30% by weight in the furniture/fitment.

O155 Glass

Glass can be used if the following requirements are met:

- Lead glazing, crystal glass and wire reinforced glass must not be used.
- Glass must be readily replaceable should it become damaged or broken.
- It must be possible to recycle the glass.

- Mirror glass must not have a metal coating that contains copper.
- Lead-based paint used in a metal coating for mirror glass must not contain more than 0.2% by weight of lead.

- A declaration from the furniture manufacturer stating which type of glass is used in the furniture.
- User instructions or other document informing the customer how to replace damaged glass.
- A declaration from the glass supplier that the glass can be recycled.
- Mirror glass: A declaration from the mirror glass manufacturer that the metal coating does not contain copper, that any paint used does not contain lead or that the lead content in the paint is below 0.2% by weight.

Background to requirement O155 glass

The requirements for glass were also included in Version 4 of the criteria but have now been merged into one requirement. The requirement has changed as it must be possible to recycle all types of glass used in Nordic Swan Ecolabelled furniture. Previously, the requirement for recycling only applied to laminated glass. It is also now more explicit that the requirement concerning copper applies to the process of plating copper as a coating. A reflective metal coating, usually silver, is used in mirror glass. Silver is applied to the surface of the glass using two different processes, the tin process, or the copper process. Tin is mainly used nowadays, because copper contaminates wastewater and is difficult to remove before being discharged. The copper process is therefore prohibited and must not be used. Lead-based paints are used to protect the silver from corrosion. To limit the lead in paints, lead content must not exceed 0.2% by weight.

O156 Surface treatment of glass

The glass must not be surface treated with chemical products and nanomaterials* with antibacterial or disinfectant properties.

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

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

- A declaration from the manufacturer of the glass.

Background to requirement O156 surface treatment of glass

The requirement is new. Glass must not be surface treated with chemicals and nanomaterials that have an antibacterial or disinfectant effect. For more background on antibacterial substances, see O17.

5.15.1 Requirements if glass is included with more than 30% by weight in the furniture/fitment

O157 Recycled glass

At least 30% by weight of the glass must consist of recycled glass.

Recycled glass is defined as pre- and post-consumer in accordance with ISO 14021, see Definitions.

- Declaration from the glass manufacturer stating the proportion of recycled glass according to the definition in the requirement.

Background to requirement O157 glass included with more than 30% by weight in the furniture/fitment

The requirement is new and has been added after consultation. The consultation proposal contained a general requirement that all furniture and fitments should contain a certain proportion of renewable, recycled, or reused material. This requirement was removed as it became too complex to write such a requirement that was suitable for all types of furniture that can be Nordic Swan Ecolabelled. Even if the requirement has been removed, Nordic Ecolabelling wishes to set requirements for recycled material where possible.

Products that contain a lot of glass such as shower walls can be Nordic Swan Ecolabelled according to the product group definition in the criteria. As the products largely consist of glass, a requirement has been introduced that they to some extent must consist of recycled glass. The requirement applies when glass makes up more than 30% by weight of the product. Glass is recyclable and as long as it is clean enough, the quality is the same as for glass made from virgin material. Shower walls usually consist of tempered glass and it is also possible to temper recycled glass. The requirement limit is set so that at least 30% of the glass must consist of pre- or post-consumer recycled glass. There are glass manufacturers today who use recycled glass in this amount in their production.

5.16 Linoleum

The requirement in this section applies when linoleum makes up more than 5% by weight of the finished furniture.

O158 Linoleum

Linoleum that is used must fulfil relevant requirements or be inspected and included as a material in a licence for Nordic Swan Ecolabelled linoleum flooring in compliance with the criteria for Floor Coverings, generation 6 or later.

- Documentation in accordance with the requirements in the criteria for Nordic Ecolabelling of floor coverings, generation 6 or later.
- Name, manufacturer, and licence number for the Nordic Swan Ecolabelled linoleum flooring where the linoleum has been inspected.

Background to requirement O158 linoleum

Linoleum may be included as a material in furniture, for example, as a surface on a table. The requirement was added to version 4 in response to demand for Nordic Swan Ecolabelling of furniture with linoleum. The requirement is unchanged.

5.17 Natural stone and agglomerated stone

Natural stone and agglomerated stone are new materials in these criteria. The requirements are based on the EU's revised criteria for hard coverings, version 2020. Nordic Ecolabelling also sets requirements for general principles and rights for workers.

O159 Natural stone and agglomerated stone

Natural stone and agglomerated stone must meet relevant requirements in the EU Ecolabel's criteria for Hard Coverings, version 2021 or later.

- ☐ Documentation in accordance with the documentation requirements in the EU Ecolabel's criteria for Hard Coverings, version 2021 or later.

O160 General principles and rights

The licensee shall ensure that quarries and further processing of natural and agglomerated stones used in production comply with:

- Relevant national laws and regulations
    - The following International Labour Organization (ILO) conventions:
    - Prohibition of forced labour (ILO Convention Nos. 29 and 105)
    - Freedom of organization and protection of the right to organize and conduct collective bargaining (ILO Convention Nos. 87, 98, 135 and 154)
    - Prohibition of child labour (ILO Convention Nos. 138, 182 and 79 and ILO Recommendation No. 146)
    - No discrimination (ILO Convention 100 and 111 UN Convention on the Elimination of Forms of Discrimination against Women)
    - No brutal treatment – Physical abuse or punishment, as well as threats of physical abuse are prohibited. The same applies to sexual or other offenses.
    - Workplace health and safety (ILO Convention No. 155 and ILO Recommendation No. 164)
    - Reasonable salary (ILO Convention No. 131)
    - Working hours (ILO Convention Nos. 1 and 14)

The licensee shall have a publicly available policy for work with social and ethical requirements, and written routines and procedures to ensure that this is followed at quarries and subsequent processing facilities.

- ☐ Publicly available policy for work with social and ethical requirements.
- ☐ Written routines and procedures to ensure that the quarries and subsequent processing facilities comply with the requirement.

Background to requirement O59 and O160 naural- and agglomrated stone

Requirement and documentation according to the EU Ecolabel's criteria for Hard Coverings, version 2021.

The requirement is new and is considered relevant as quarries and further processing can take place in countries outside Europe where workers' rights may be limited.

5.18 Licence maintenance

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

O161 Customer complaints

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

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

⭱ Upload your company’s routine for handling and archiving customer complaints.

Background to requirement O161 Customer complaints

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

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

O162 Traceability

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

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

⭱ Please upload your routine or a description.

Background to requirement O162 Traceability

Nordic Ecolabelling requires that your company has implemented a traceability system. To document your company’s product traceability, you must upload your company’s routine

describing these activities. The routine should be dated and signed and will normally be part of your company’s quality management system.

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

6 Environmental impact of furniture and fitments

The relevant environmental impacts throughout the lifecycle of furniture and fitments are set out in a MECO scheme. A MECO scheme highlights the key areas that affect the environment and health throughout the product's lifecycle – focusing on materials/resources consumption (M), energy (E), chemicals (C) and other impact areas (O).

Nordic Ecolabelling sets requirements concerning the topics and processes in the lifecycle that have a significant environmental impact – referred to as hotspots. Based on the MECO analysis, an RPS tool is used to identify where ecolabelling can have the greatest effect. 'R' stands for environmental relevance; 'P' represents the potential to reduce environmental impact, and 'S' refers to the steerability, which determines how compliance with a requirement can be documented and monitored. The criteria focus on those areas of the lifecycle identified as having high RPS, where there is potential to achieve positive environmental gains. For more details on the RPS analysis, please refer to the Nordic website[98].

Furniture and fitments are a very complex product group due to the diversity in products and the materials used. Overall, the life cycle of furniture and fitments can be divided into three main areas: production and supply of materials, products manufacturing and downstream activities (i.e. product distribution, retail, use, maintenance and end of life). A study by study be Cordella and Hidalgo (2016) clearly describes where the main environmental impacts are found: The production and supply of materials has the greatest influence on the environmental profile (average impact ratio of this stage varies from 88% to 98%, depending on the impact category). A secondary role is played by product manufacturing (average ratio of this stage is 2% to 12%), distribution (average ratio of stage is from 6% to 14%) and end of life (average ratio of stage is 1% to 22%)[99]. Overall, the literature study be Cordella and Hidalgo (2016) concludes that;

“the environmental profile of furniture is mainly defined by materials. Environmental impacts could thus be reduced effectively through a careful selection of materials and by increasing the efficiency of use of resources. The durability of products can also have a significant influence on the life cycle impacts, as well as disposal scenarios. The toxicity of substances used in furniture is another aspect of potential concern while other aspects appear of secondary importance from a life cycle point of view.”

The revision of the EU Green Public Procurement (GPP) criteria for Furniture defines an approach for procurement of new furniture products. This defines other essential parameters to take into account apart from the focus on materials. In the GPP criteria the focus is particularly on the longevity of products via criteria for durable upholstery materials, ease of repair and disassembly, availability of spare parts and the encouragement of longer warranties.[100]

[98] https://www.nordic-ecolabel.org/nordic-swan-ecolabel/criteria-process/ (accessed February.2025)
[99] Cordella and Hidalgo (2016): Analysis of key environmental areas in the design and labelling of furniture products: Application of a screening approach based on a literature review of LCA studies
[100] Donatello et al. (2017): Revision of the EU Green Public Procurement (GPP) criteria for Furniture

RPS scheme

Life cycle stages	Area and assessment of R, P, S (high, medium or low)	Comments
Raw materials		
	Wood raw materials: sustainable forestry R: High P: High S: High	Wood raw materials used in furniture have a high RPS. From a lifecycle perspective, forestry plays a key role in the environmental impact of wood products. It is crucial that wood, as a renewable raw material, is grown, harvested and used in a sustainable way. A significant portion of global forest loss is driven by the conversion of natural forest to other land uses, such as cattle farming, palm oil and soy plantations. Deforestation and degradation caused by illegal and unsustainable logging, fires, and fuelwood harvesting can harm wildlife, threaten livelihoods and intensify climate change. Credible forest management certification helps promote a more sustainable wood/timber product industry by creating market conditions that support forest conservation. Requirements for a high share of certified wood raw materials and certified traceability ensure more sustainable forestry.
	Organic cotton R= Medium-high P= medium S= Low	For furniture with a high proportion of cotton textiles, there is medium-high relevance in relation to the use of organic cotton. However, organic cotton still makes up a small proportion of the total cotton production leading to a medium potential due to the availability in the market. Since it is typically not the furniture productions themselves that purchase cotton, the steerability is assessed to be low.
	Chemicals used in textiles and filler material R= High P= High S= Low-Medium	For furniture with a high proportion of textiles, there is high relevance for setting chemical requirements for harmful chemical substances in textiles. The potential is high as alternatives can often be found. However, the information must often be retrieved several links back in the production chain and can therefore be difficult to document/control (low-medium S). It is therefore essential to focus on requirements with the highest RPS.
	Chemicals – additives in plastic R= High P= Medium S= Medium	Problematic additives in plastic parts have high relevance and there is potential for selecting alternative materials. In the production chain leading back to the actual mixing of plastic granules with additives there is often high steerability for the chemical substances used.
	Plastic and metal: Recirculated raw materials R= High P= Medium S= Low-medium	Production of virgin plastic and metals have high climate impact and other environmental impacts (e.g. mining activities and production chemicals). Relevance is high for products with high share of metal or plastic. The potential (availability) of alternative products made of e.g. recycled metal is medium. The possibility to document the environmental performance is possible but often complex due to

		the lack of good certification schemes. Therefore, steerability is low-medium.
	Energy – material production R= High P= Medium S= Low-medium	Many of the materials used for furniture are highly processed meaning that they are associated with high energy consumption. This means that there is high relevance in relation to the energy use related to material production, including raw material extraction. The potential for minimizing the energy use is considered to medium but the steerability is low as the production chains are often complex and the availability of reliable data is low.
	Energy production related to adhesive/resin R= Medium P= Low-medium S= Low-medium	For furniture with a high share of boards/panels, part of the energy load will come from the production of raw materials for the glue in the boards. However, the potential for energy savings is not clear and data will have to be retrieved several links back in the production chain. Both potential and steerability are considered to be Low-medium.
Production/distribution		
	Energy - production of board and panels R: High P: Medium S: Medium	Board and panel production is relatively energy intensive, meaning that the relevance is high. The energy efficiency of the producers vary but documenting this can be difficult due to the lack of comparable data. Steerability is medium as it is possible to receive reliable data from the producers for gate-to-gate.
	Production chemicals (pigments, VOC, biocides etc.) R: High P: Medium-high S: Medium	High relevance is found for formaldehyde, VOCs, isothiazolinones in binders, use of problematic substances in surface treatments and other chemical products used in furniture production, e.g. VOCs, flame retardants, nanoparticles used in surface treatments and heavy metals in pigments. The potential is medium-high as alternatives can often be found, steerability is good as the products specifically used can be documented.
	Energy for drying processes related to surface treatment R= Medium P= Medium S= Medium	Energy related to drying processes can be significant depending on the surface treatment system used. There is a potential for energy savings of the production systems or changing surface treatment system. The steerability is medium unless the work is done at a sub-supplier.
	Resource efficiency per functional unit – (production) R= High P= medium S= low	Resource efficiency is high relevant for optimizing material use. Since furniture can consist of different types of materials and have very different designs, there is in principle a potential to optimize the design to be more resource-efficient in relation to the furniture's function. However, the designs are typically not defined by the furniture producers leading to a low steerability.
Use phase		
	Quality, warranty and properties R: High P: Heig	To ensure a low environmental impact of the product seen over the products lifetime it is essential to ensure high quality. Relevance is high. There is a wide variety of quality on the

	S: Heig	market, including products with a very low lifetime, therefore high relevance. The steerability is high as there are quality test standards available for the individual types of furniture that are used by the furniture industry.
	Spare parts and disassembly R: High P: Heig S: Heig	Having spare parts available is essential to ensure a long lifetime for the products. Being able to disassemble the products makes recycling and reuse much easier in the future. Relevance, potential and steerability are all considered high.
End of life		
	Furniture recycling R= High P= High S= very low	Relevance and potential are high in relation to energy and resource use. However, there are challenges regarding receiving the needed amounts of materials / products at the right time and there is low possibility to ensure that no harmful substances are present in the recycled materials. Steerability is low.

MECO scheme

In the following table the background for the identification of the environmental impact of specific materials or chemicals is described further in the background of other relevant criteria documents. This referred to in the following way: “CT”: criteria for textiles, hides/skins and leather, “CP”: criteria for panels and boards. Other relevant studies are referred to in the foot notes.

	Raw material production	**Production**	**Use phase**	**End of life**
Raw materials/materials	Solid wood and wood fibres (renewable) [CP] Adhesives (oil-based/bio-based) [CP] Metal (steel/iron/alu/brass) Plastic[101] Textile (wool/cotton/viscose/synthetics) [CT] Leather (renewable) [CT] Filler materials (oil-based/feather/down) [CT]	Energy raw materials for drying processes for surface treatment, board production [CT, CP] Resource efficiency in terms of material selection and utilisation and furniture design [96 and 102]	Replacement of spare parts, refilling of upholstery [99 and 100]	Recycling of furniture and recycling of materials such as metal, plastic and wood.[CP, 1]
Energy/CO2 emissions	Energy raw materials for the production of metal[99], plastics[99], and wooden board production[CP] (adhesive raw materials in boards, drying of wood, mechanical work).	Energy raw materials for drying processes for surface treatment, board production[CP]		Energy recovery by incineration.
Chemicals	Red sludge from aluminium production[CT]	Allergenic acrylates in UV varnish.	Emissions of formaldehyde, VOCs in surface treatment and during maintenance[CP].	

[101] Cordella and Hidalgo (2016): Analysis of key environmental areas in the design and labelling of furniture products: Application of a screening approach based on a literature review of LCA studies
[102] Donatello et al. (2017): Revision of the EU Green Public Procurement (GPP) criteria for Furniture

	Antimony from polyester fibre production[CT] Pesticides from forestry (incl. rattan)[CT]	Emission of VOCs and formaldehyde from coatings and adhesives.[CP] Wastewater from e.g. dyeing, tanning processes from leather production[CT] Spray booths with non-biodegradable substances (high COD and BOD[103]) Plastic additives containing problematic substances[104]	Chrome plating of metal. [105] Treatment of textiles with flame retardants, dirt-repellent coatings and biocide (e.g. during freight)[106] [107]	
Other	Sustainable forestry, organic cotton production. [CP] Animal welfare (down/feathers) [CT]		Quality, lifespan, possibility of purchasing spare parts/new cover.	

[103] Mapping of substitution possibilities as well as health and environmental assessment of paint systems for Industrial Surface Treatment of Metal and Wood, MST 2011
[104] United Nations Environment Programme and Secretariat of the Basel, Rotterdam and Stockholm Conventions (2023). Chemicals in plastics: a technical report. Geneva.
[105] MST, Massestrømsanalyse af chrom og chromforbindelser, https://www2.mst.dk/udgiv/publikationer/2002/87-7972-374-8/html/kap03.htm
[106] Hazardous chemicals in textiles, A report from the swedish agency, 2013
[107] Boris Rybin et al. , Chemical Safety of Furniture Products, 2019

Sources for MECO

7 Future criteria generation

8 Criteria version history

9 How to apply and regulations for the Nordic Ecolabelling

Application and costs

For information about the application process and fees for this product group, please refer to the respective national website. For contact information see the beginning of this document.

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

Licence validity

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

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

On-site inspection

In connection with handling of the application, Nordic Ecolabelling normally performs on-site inspection visit/-s to ensure adherence to the requirements. For such an inspection, data used for calculations, original copies of submitted certificates, test records, purchase statistics, and similar documents that support the application must be available for examination.

Queries

Please contact Nordic Ecolabelling if you have any queries or require further information. See contact info in the beginning of this document. Further information and assistance (such as calculation sheets or electronic application help) is available. Visit the relevant national website for further information.

Follow-up inspections

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

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

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

Regulations for the Nordic Ecolabelling of products

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

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

Appendix 1 Laboratories and methods for testing and analysis

General requirements for test and analysis laboratories

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

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

The applicant's laboratory can be approved if it is accredited and complies with the requirements of the standard EN ISO 17025.

When testing quality and performance properties, the applicant's own laboratory can be approved even if it is not accredited. The following applies:

- The laboratory has a certified quality system (ISO 9001) which includes testing, and
- The laboratory can show that the test results obtained are similar to the results from an accredited test laboratory through initial tests performed as parallel tests. Parallel tests must as a minimum be performed when test standards are updates, and
- The laboratory performs the tests in accordance with an established plan for the current test standard and documents the selection of products in a product series for worst case tests, and
- An independent inspection body shall, on the basis of test reports, confirm that the manufacturer's test results are consistent with the results of an accredited laboratory. This can, for example, be evaluated as part of an inspection of the laboratory's quality system carried out by the inspection body for certification of the quality system.

Test method for COD / TOC emissions

COD content should be tested according to ISO6060 or equivalent. If another analysis method is used, the licence applicant must show that it is equivalent. An analysis of PCOD or BOD may also be used as verification if there is a correlation with COD. The method for measuring TOC is ISO 8245 Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC).

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

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

Appendix 2 Energy calculation wood-based panels and laminate

The following applies to the energy calculation in the production of wood-based panels and laminate:

1. Energy consumption is calculated as an annual average for the entire business or the production line that is relevant for Nordic Swan Ecolabelled furniture / furnishings.

2. The energy consumption, calculated as MJ / kg panel, shall include the primary panel production and production of the main raw materials, which are included in the panel. The main raw materials are raw materials that make up more than 2% by weight of the finished board (e.g. wood fibre and glue).

System delimitation for calculation:

- Energy consumption from the extraction of raw materials shall not be included in the calculation.
- For panel production, the energy calculation must be based on data from and including raw material handling up to and including the finished panel, before any surface treatment. The calculation is thus exclusive of cultivation and felling of the wood, but including drying of wood and conveyor belts both at the sawmill and in the production line as well as the panel production itself. Transport in all phases and energy consumption during surface treatment shall not be included. Lamination of the panel must, however, be included in the calculation.
- For the manufacture of chemical products, such as glue, the energy calculation shall be based on data from the production of both glue and the constituent raw materials. The energy content of the raw material must not be included. In the absence of specific energy data for the adhesive, a value for adhesive of 15 MJ / kg (use solution) can exceptionally be used. When using several different subcontractors for the same type of raw material, it is accepted that the calculation is made on the supplier that is most often used.
- With regard to fuel energy, both energy from purchased fuel, internally produced fuel and energy from residual products must be included. Self-produced energy and surplus energy that is resold must be stated, but does not count in the calculation as used energy. Self-produced energy refers to energy (electricity and heat) that has not been purchased from an external supplier. Internally produced fuel sources and residual products are not considered self-produced energy.

Appendix 3 Energy requirements for paper and pulp production

Energy calculation guidelines

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

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

Non-integrated pulp mill

Electricity

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

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

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

Fuel

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

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

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

**Excess energy*

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

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

Verification

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

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

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

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

The calculation sheet produced by Nordic Ecolabelling can be used.

Non-integrated paper mill

Electricity

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

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

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

Fuel

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

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

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

**Excess energy*

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

Verification

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

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

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

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

The calculation sheet produced by Nordic Ecolabelling can be used.

Steam

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

Energy calculation, paper production

Energy score for paper production

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

$$P_{paper\_electricity} = \frac{Electricity_{consumed}}{Electricity_{reference}}$$

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

The following reference values for kraft paper must be used:

$Electricity_{reference}$ = 1600 kWh/ADt

$Fuel_{reference}$ = 2100 kWh/ADt

Verification

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

Energy score when a mixture of different pulp types are used

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

$$P_{pulp\_electricity} = \sum_{i=1}^{n} P_{pulp\_electricity\_i} \cdot pulp_i$$

$$P_{pulp\_fuel} = \sum_{i=1}^{n} P_{pulp\_fuel\_i} \cdot pulp_i$$

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

Verification

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

Total energy score for paper and pulp production

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

$$P_{electriciy} = P_{electriciy\_pulp} + P_{electriciy\_paper}$$

$$P_{fuel} = P_{fuel\_pulp} + P_{fuel\_paper}$$

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

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

Verification

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

Energy score for pulp production

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

$$P_{pulp\_electricity\_i} = \frac{Electricity_{consumed}}{Electricity_{reference}}$$

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

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

Table 1: Reference values pulp

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

Slip	N/A	2000
Dried slip	900	2050

Verification

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

Table 2: Steam table

Enthalpy in gauged steam, h´´, as a function of absolute pressure, p or temperature, t. Enthalpy is divided by an efficiency of 0.9 and added to the heat consumption.

p Bar	t 0C	h´´ KJ/kg	p bar	t 0C	h´´ KJ/kg
0.50	81.3	2646.0	16.0	201.4	2791.7
0.60	86.0	2653.6	17.0	204.3	2793.4
0.80	93.5	2665.8	18.0	207.1	2794.8
1.00	99.6	2675.4	19.0	209.8	2796.1
1.20	104.8	2683.4	20.0	212.4	2797.2
1.40	109.3	2690.3	22.0	217.2	2799.1
1.60	113.3	2696.2	24.0	221.8	2800.4
1.80	116.9	2701.5	26.0	226.0	2801.4
2.00	120.2	2706.3	28.0	230.1	2802.0
2.50	127.4	2716.4	30.0	233.0	2802.3
3.00	133.5	2724.7	32.0	237.5	2802.3
3.50	138.9	2731.6	34.0	240.9	2802.1
4.00	143.6	2737.6	36.0	244.1	2801.7
4.50	147.9	2742.9	38.0	247.3	2801.1
5.00	151.8	2717.5	40.0	250.3	2800.3
6.00	158.8	2755.5	45.0	257.4	2797.7
7.00	165.0	2762.0	50.0	263.9	2794.2
8.00	170.4	2767.5	55.0	269.9	2789.9
9.00	175.4	2772.1	60.0	275.6	2785.0
10.00	179.9	2776.2	65.0	280.8	2779.5
11.00	184.0	2779.7	70.0	285.8	2773.5
12.00	188.0	2782.7	80.0	295.0	2759.9
13.00	191.6	2785.4	90.0	303.3	2744.6
14.00	195.0	2787.8	100.0	311.0	2727.7
15.00	198.3	2789.9	110.0	318.1	2709.3

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

Appendix 4 Azo dyes and aromatic amines

Carcinogenic aromatic amines	CAS No.
4-aminobiphenyl	92–67–1
Benzidine	92–87–5
4-chloro-o-toluidine	95–69–2
2-naphthylamine	91–59–8
o-amino-azotoluene	97–56–3
2-amino-4-nitrotoluene	99–55–8
p-chloraniline	106–47–8
2,4-diaminoanisole	615–05–4
4,4'-diaminodiphenylmethane	101–77–9
3,3'-dichlorobenzidine	91–94–1
3,3'-dimethoxybenzidine	119–90–4
3,3'-dimethoxybenzidine	119–93–7
3,3'-dimethyl-4,4'-diaminodiphenylmethane	838–88–0
p-cresidine	120–71–8
4,4'-oxydianiline	101–80–4
4,4'-thiodianiline	139–65–1
o-toluidine	95–53–4
2,4-diaminotoluene	95–80–7
2,4,5-trimethylaniline	137–17–7
4-aminoazobenzene	60–09–3
o-anisidine	90–04–0
2,4-xylidine	95–68–1
2,6-xylidine	87–62–7
4,4'-methylene-bis-(2-chloro-aniline)	101–14–4
2-amino-5-nitroanisole	97–52–9
m-nitroaniline	99–09–2
2-amino-4-nitrophenol	99–57–0
m-phenylenediamine	108–45–2
2-amino-5-nitrothiazole	121–66–4
2-amino-5-nitrophenol	121–88–0
p-aminophenol	123–30–80
p-phenetidine	156–43–4
2-methyl-p-phenylenediamine; 2,5-diaminotoluene	615–50–9
2-methyl-p-phenylenediamine; 2,5-diaminotoluene	95–70–5
2-methyl-p-phenylenediamine; 2,5-diaminotoluene	25376–45–8
6-chloro-2,4-dinitroaniline	3531–19–9

Appendix 5 Guidelines for standard, renewable commodities

Nordic Ecolabelling sets requirements on the standards to which cultivated commodities are certified. These requirements are described below. Each individual national sustainability standard and each certification system is reviewed by Nordic Ecolabelling to ensure that the requirements are fulfilled.

Requirements on standards

- The standard must balance economic, ecological and social interests and comply with the Rio Declaration's principles, Agenda 21 and the Forest Principles, and respect relevant international conventions and agreements.
- The standard must contain absolute requirements and promote and contribute towards sustainable cultivation. Nordic Ecolabelling places special emphasis on the standard including effective requirements and that the requirements protect the biodiversity.
- The standard must be available to the general public. The standard must have been developed in an open process in which stakeholders with ecological, economic and social interests have been invited to participate.

The requirements related to the sustainable standards are formulated as process requirements. The basis is that if stakeholders agree on the economic, social and environmental aspects of the standard, this safeguards an acceptable requirement level.

If a sustainability standard is developed or approved by stakeholders with ecological, economic and social interests, the standard may maintain an acceptable standard. Accordingly, Nordic Ecolabelling requires that the standard balances these three interests and that representatives from all three areas are invited to participate in development of the sustainable standard.

The standard must set absolute requirements that must be fulfilled for the certification. This ensures that the agriculture management fulfils an acceptable level regarding the environment. Since Nordic Ecolabelling requires that the standard must promote and contribute towards sustainable cultivation, the standard must be assessed and revised regularly for process improvement and successively reduce environmental impact.

Requirements on certification system

- The certification system must be open, have significant national or international credibility and be able to verify that the requirements in the sustainable standard are fulfilled.

Requirements on certification body

- The certification body must be independent, credible and capable of verifying that the requirements of the standard have been fulfilled. The certification body must also be able to communicate the results and to facilitate the effective implementation of the standard.

The certification system must be designed to verify that the requirements of the standard are fulfilled. The method used for certification must be repeatable and applicable so the requirements can be verified. Certification must be in respect to a specific sustainable standard. There must be inspection prior to certification.

Requirements on Chain of Custody (CoC) certification

- Chain of Custody certification must be issued by an accredited, competent third party.
- The system shall stipulate requirements regarding the chain of custody that assure traceability, documentation and controls throughout the production chain.

Documentation

- Copy of cultivation standard, name, address and telephone number to the organisation who has worked out the standard and audit rapports.

- References to persons who represents stakeholders with ecological, economic and social interests who have been invited to participate.

- Nordic Ecolabelling may request further documents to examine whether the requirements of the standard and certification system in question can be approved.