About Nordic Swan Ecolabelled

Supplies for microfibre based cleaning

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CONSULTATION

Nordic Ecolabelling

Content

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1 Summary

Cloths, mops, and pads containing microfibres (i.e., fibres less than 1 decitex (Dtex) thick) can be used for dry or damp cleaning and are effective without the use of cleaning chemicals. Microfibres are made of polyester and/or polyamide, which are both synthetic fibres. The cloths/mops/pads may also contain other types of textile fibres, which can be synthetic or natural. The main positive environmental contribution is that the amount of cleaning chemicals is reduced because microfiber cleaning products can clean effectively without chemicals.

The textile industry is one of the industries in the world that have the highest resource consumption and negative environmental impact. The textile industry has realised that a more sustainable textile production and consumption must be achieved. The focus areas for the industry are:

1. Sustainable fibre
2. Substitution of hazardous chemicals
3. Reduction in energy and water consumption
4. Recycling and a circular economy
5. Responsible production in terms of workers' rights
6. Focus on quality

Even though, microfibre products form only a small part of the textile industry, they contribute to the environmental burden of the industry. Since the Nordic Swan Ecolabelling of supplies for microfibre based cleaning evaluate the entire life cycle of the product, and all the relevant sustainability parameters, the criteria deal with all six areas listed above.

The Nordic Swan Ecolabelling of supplies for microfibre based cleaning also include cleaning tools, such as mop handles and stands, but only if they are to be used and sold together with the microfibre product in the same packaging. There are requirements to the materials and chemicals used in the tools. At the same time, it must be possible to remove the cleaning fabric from the cleaning tool to enable reuse of the tool and recycling of each material.

New textile fibre requirements:

This, generation 3 of the criteria, includes newly developed requirements concerning textile fibres. They are, in part:

At least 30% of the polyester must be based on either recycled or bio-based materials. With a test requirement for specific harmful chemicals in recycled fibres as well as requirements for the cultivation of bio-based raw material. The remaining part of the polyester must live up to requirements regarding amount of antimony.

At least 20% of the polyamide must be based on recycled materials or all polyamides must fulfil requirements regarding low emission of N_2O.

Cotton must be GMO-free (genetically modified organisms) and must be either organic, recycled, certified by BCI (Better Cotton Initiative), Fairtrade cotton or CmiA (Cotton Made in Africa).

Regenerated cellulose fibre must be recycled, and the actual fibre production must be with closed loop technology.

Updated textile chemical requirements:

The following three requirements are tightened and covers the chemicals in the textile production:

Chemical products with undesirable classifications such as toxic, carcinogenic, and harmful to the aquatic environment are prohibited.

Substances classified as CMR are prohibited.

It must be clearly demonstrated that none of the 11 groups of substances from the criteria's restricted substances list have been used. This list is aligned with Greenpeace's Detox My Fashion campaign[1]

The chemical requirements in the new generation use a definition of ingoing substances that bans specific ingoing substances down to 0 ppm. As such, a safety data sheet alone is not enough to meet the documentation requirement and further information about the chemicals will always be needed.

New requirements for energy and water consumption at textile production:

There is a new requirement regarding implementation of a minimum of BAT practices to reduce energy and water consumption. This means that the textile production must be water- and energy-efficient and thus deliver reduced CO_2 emissions.

Tightened requirements for cleaning tools:

The requirements for materials used in cleaning tools, such as mop handles and stands, have been tightened.

The amount of recycled aluminium has been increased.

Biodegradable plastics or plastic composites can disrupt the processes at the recycling plants and reduce the quality of the recycled plastic. There is therefore a new requirement ban these types of materials.

Also, surface treatment of tools with antibacterial substances and nanomaterials have been banned.

Tightened quality requirements:

A new requirement regarding durability of the products has been inserted. Professional products must have a good cleaning effect after at least 500 washes and domestic products after 200 washes.

[1] Destination Zero: Seven Years of Detoxing the Clothing Industry, https://storage.googleapis.com/planet4-international-stateless/2018/07/destination_zero_report_july_2018.pdf accessed 07.08.2019

The requirements regarding assessment of hygienic conditions and formaldehyde emissions have been tightened.

New requirement for testing loss of fibre fragments:

There is a new requirement regarding that loss of fibre fragments must be tested during washing. Loss of fibre fragments can e.g., be microplastics.

New requirements for fundamental principles and rights at work:

There is a new requirement regarding fundamental principles and rights at work at the textile manufacturing and processing, such as all dyeing plants and cut-make-trim (CMT) factories (e.g., sewing factories).

New requirement on supplier controls:

There is a new requirement for the licensee to conduct annual assessments of the subcontractors used.

For a further description of the changes in the revised version, please see the background text for the requirements.

2 Environmental impact of Supplies for microfibre based cleaning

These criteria mainly cover cleaning fabric that contain microfibres (e.g., mops and cloths), but also cleaning tool if they are to be used and sold with the cleaning fabric. Therefore, the criteria have requirements that cover both the cleaning textiles and the tools.

Because microfibre cleaning products can clean effectively without cleaning chemicals the environmental impact in the use state of the product is reduced compared with cleaning products that do not contain microfibres. The main environmental impact of supplies for microfibre based cleaning relates to the production of materials used to make the product, such as textile, plastic, and metal. Relevant environmental impacts are linked to resource use, chemicals of concern, energy consumption and carbon footprint and biodiversity. The environmental impacts during production of the actual product are linked to emissions of substances that are harmful to health and the environment in connection with processing the textiles and materials, gluing and e.g., surface treatment processes of cleaning tools. Apart from the actual materials and production process, there are other aspects that have effects on the environmental impact. Good quality and a long service life of the product have direct positive effects on the environmental impact by reducing the production of new supplies for microfibre based cleaning. Ensuring that it is possible to recycle the materials in the cleaning tool at the end of its life also minimises negative impacts on the environment when the product has become worn out.

See more details regarding the environmental impact of supplies for microfibre based cleaning in chapter 2.1 MECO analyses and chapter 2.2 RPS analyses. Details about Nordic Swan Ecolabelled supplies for microfibre based cleaning and circular economy is found in chapter 2.3 and about the contribution to UN

Sustainable Development Goals in chapter 2.4. Information about microplastics and fibre fragment loss from textiles are found in chapter 2.5. In addition, see more details regarding the environmental impact of textile production below.

2.1 Qualitative MECO analysis

The relevant environmental impacts found in the life cycle of supplies for microfibre based cleaning are set out in the qualitative MECO table below. A MECO describes the key areas that have impact on the environment and health throughout the life cycle of the product – including consumption of materials/resources (M), energy (E), chemicals (C) and other impact areas (O).

The functional unit for the product group is in principle 1 m^2 cleaned area with a cloth / mop without the use of chemicals still achieving a high cleaning quality. Therefore, if a quantitative MECO were to be developed, it would be relevant to make it for this functional unit. However, it has been assessed that a qualitative MECO is better suited here, as there are several subgroups for the area cleaned (e.g., table surface cleaned with a cloth and floor surface with a mop).

The performed MECO is made for products with microfibres e.g., cloths and mops, but also other fibre types and cleaning tools (e.g., mop shaft) are included, as the criteria also covers those.

Qualitative MECO matrix for the life cycle of supplies for microfibre based cleaning.

	Raw material stage	**Production**	**Use stage**	**Waste and recycling stage**
Raw materials/ inputs	Fossil-based synthetic textile fibres (Polyester, polyamide, polypropylene, and polyurethane): Land use for crude oil. Energy resources for production. Emissions during production. Bio-based synthetic textile fibres: (Polyester and possibly other synthetic fibres): Land use, use of both primary and secondary renewable raw materials such as palm oil, soya, sugar cane etc. Energy resources for cultivation, harvesting and fertilizer. Water for cultivation. Energy resources for production. Emissions during production. Vegetable textile fibres (Cotton (and other seed fibres of cellulose) and regenerated cellulose fibres (e.g., viscose)): Land use. Energy resources for cultivation, harvesting and fertilizer. Water for cultivation. Energy resources for production.	Energy resources for production. Remissions to air and water during production.	Possibly water (less water used than when using cotton cloths and mops). Washing and drying of cloths and mops: Raw materials such as water and washing chemicals. Energy raw materials for washing and drying.	Recycling or incineration of textile fibres. Mix of different textile fibres destroys/ complicates the possibility of textile recycling. Recycling of aluminium and plastic from cleaning tools. To make recycling possible, the materials of the tool must be able to be separated from each other.

	Cleaning tools: Aluminium: Land use for mining of metals. Plastic: Use of fossil or renewable resources.			
Energy	Energy to produce synthetic fibres and for cultivation of vegetable fibres. Energy to produce aluminium and plastic for cleaning tools.	Energy for the processes spinning, knitting, weaving, dyeing, finishing, cut, make, and trim. Energy resources to produce cleaning tools.	Energy for washing and drying cloths and mops.	Loss of resources by landfill and incineration. Energy utilization in the combustion of textile fibres and cleaning tools. Saved energy and resources by recycling textile fibres and by recycling materials in cleaning tools or reuse of cleaning tools.
Chemicals and emissions	Pesticides during vegetable textile fibre production and forestry. Lead-based pigment/ stabilizer in polypropylene production. Antimony from polyester production. Regenerated cellulose fibres production (e.g., viscose): chlorine gas, sulphur emissions, zinc emissions to water and copper emissions to water. N2O emission (heavy greenhouse gas) from polyamide production. Surface treatment of cleaning tools. Additives in plastic for cleaning tools.	Chemicals from wet processes, printing, and finishing, e.g., carcinogenic azo dyes (amines), phthalates in printing, heavy metals, formaldehyde, and nanomaterials. COD in wastewater from textile wet processes. Additives and surface treatment of cleaning tools, e.g., phthalates, heavy metals, and nanomaterials.	Laundry detergents and other chemicals for machine washing of cloths and mops.	Risk of passing undesirable chemicals onwards in the lifecycle by recycling textiles and plastic with no traceability. Potential to reduce chemical impact from raw material phase by reusing textile fibres, plastic, and aluminium.
Other	Sustainable cultivation of vegetable raw materials to reduce negative impact on biodiversity and natural areas.	Temperature changes in aquatic environment (textile wet processes). Social and ethical challenges associated with working conditions for textile production outside the EU.	High cleaning quality without the use of chemicals is the most important property of microfibres. Long service life of the product reduces the environmental impact. Loss of microplastic from use and washing of mops and cloths.	

			Friction: Time saving (low friction provides faster cleaning) and ergonomics (different fibres and mixes provide different friction).	

Summary of the most important environmental impacts found in the MECO analysis

The raw material stage:

The raw material consumption in the product group is mainly crude oil, which is used for production of synthetic textile fibres, cleaning tools in plastic, for laundry detergents and other washing chemicals used in the use stage. In mops, metal will also be a frequently used raw material in the shaft. The shaft often has a long service life, while the textile part itself is replaced more often.

In addition, consumption of various energy raw materials has also been linked to both the raw material, production, and the use stage. There are no specific energy raw materials here that should be highlighted, as it will depend on the available energy sources where the processes take place.

Energy load will also depend on the service life of the cloth and the mop. The longer the service life, the more washes of the product during the use phase and thus the use stage becomes more important. However, a longer service life where a cloth / mop can clean to a high quality without chemicals results in an overall lower environmental impact for the entire life cycle.

Production of textile fibres:

The production of both polyamide and polyester, which are mainly the fibres used to produce microfiber, contributes to an important part of the environmental impact. Both types of fibre are energy-intensive to produce and at the same time different chemical impacts are coupled to their production. The most important are described here:

Nitrous gases (N_2O) are emitted during the production of monomer for polyamide production. N_2O is a greenhouse gas that is also toxic by inhalation. In addition, some solvents can be used in some productions, but this can be reduced if the production takes place by melt spinning without the use of solvents or by a control plan to control VOC emissions in the fibre production. Melt spinning is stated in the BAT report as the preferred method for polyamide, so it is not relevant to set a requirement regarding that fibre production must be produced with this method.

Polyester: By textile polyester is meant PET, a synthetic polymer of terephthalic acid (or dimethyl terephthalate) and nonethylene glycol. These are raw materials that are readily available from the cracking of crude oil. Polyester can also be produced from bio-based raw material instead of crude oil. Production of PET fibre often takes place with the catalyst diantimony trioxide (Sb_2O_3), which can

leave residues of the antimony catalyst in polyester. Antimony is a harmful substance.

Recycled materials: By using recycled materials in textile fibres energy and resources consumption are reduced in the production of the textile.

Chemicals for textile production:

In the textile production itself, many chemicals are used, such as dyes and pigments and chemicals for finishing.

Use stage:

Microfibre cloths and mops generally have good cleaning properties and have a great effect without the use of cleaning chemicals. It is thus an important environmental effect in the use stage.

Product quality matters for the final cleaning quality and service life of the product. The service life of the product is of great importance for the overall environmental impact. With a long service life, the environmental impact per functional unit is reduced.

Cloths and mops are washed with laundry detergents and other chemicals after use and dried using energy.

When washing and possibly use of cloths and mops, there is a risk of release of microplastics, which are harmful to the environment and have a negative impact on biodiversity.

Especially for mops, ergonomics is of great importance for the working environment. Here, the friction from the fabric in the mop have a high impact on the experience when using the mop.

2.2 RPS analysis

Nordic Ecolabelling sets requirements concerning the topics and processes in the life cycle that have a high environmental impact – also called hotspots. An RPS tool is used to identify where ecolabelling can have the greatest effect. R represents the environmental relevance; P is the potential to reduce the environmental impact and S is the steerability on how compliance with a requirement can be documented and followed up.

Therefore, it makes sense for the criteria to contain requirements in areas in the life cycle that have been found to have a high overall RPS, since there is potential to achieve positive environmental gains. The table below provides an overview of the key areas where requirements are appropriate due to a high RPS.

Location of high RPS

Raw materials stage	
Textile fibre	There is high relevance for the production/cultivation of textile fibres, but considerable variation in the type of environmental impact, depending on the type of fibre. It is difficult to pick out one fibre type as the best option on every environmental impact category. In terms of environmental impact from the textile fibres, the potential for greatest steerability lies in ensuring that the individual fibre type is either cultivated or produced in the least environmentally impactful way possible. Generally, the use of recycled fibres reduced the consumption of energy and resources.

	RPS for natural fibre requirements: • Cotton must be organic, certified with Fairtrade, CMiA, or BCI, or recycled. RPS for synthetic fibre requirements: • An amount of the synthetic fibres must be produced from recycled or bio-based materials. • For bio-based synthetic fibres, there are also requirements stipulating the types of raw materials that may be used and that they must not be cultivated using genetically modified raw materials. • Recycled fibres in general are required to have been tested for content of undesirable chemicals. • For regenerated cellulose fibre, the production process must be free from discharges and the fibre must be recycled. • For newly produced fibres requirements regarding problematic chemicals in the production apply, e.g., N_2O emission and antimony.
Cleaning tools	Mainly plastic and aluminium are used as materials for cleaning tools. An amount of the plastic must be produced from recycled materials. If bio-based plastic is used, then there are requirements stipulating the types of raw materials that may be used and that they must not be cultivated using genetically modified raw materials. An amount of the aluminium must be produced from recycled materials.
Textile production	
Chemicals that are harmful to the environment and health	In this area, tackling harmful chemicals in textile production has high relevance, and there is also potential to set chemical requirements for textile production that exclude a wide range of chemical substances. To ensure that harmful chemicals are not discharged from wet processes, the greatest steerability as regards ecolabelling lies in ensuring that the harmful chemicals, such as organic fluorinated compounds and heavy metals, are not used in the processes. This ensures that these chemicals are not discharged into the aquatic environment and that they are not present in the finished textile that the user is in contact with. Testing for chemicals in wastewater is also an option but provides only a snapshot and would be a major undertaking if all the excluded substances had to be tested for. Here there is both potential and steerability in requiring that the detergents and softeners used in the textile production must be readily degradable in the wastewater treatment plant. Potential and steerability also exist for requirements concerning COD, temperature, and pH in wastewater from wet processes.
Energy and water consumption	Overall, a high RPS has been found for requiring that the textile production uses a minimum of best available water and energy efficiency technologies or has measures in place for self-production of solar energy.
Cleaning tools production	
Chemicals	In this area, additives in plastic and chemicals in the surface treatment of the cleaning tools that prevent recycling or significantly reduce the quality of the recycled materials after end of life has high relevance.
Use stage	
Quality and long service life	An overall high RPS has been found for requirements for high quality (long service life for the microfibre product and cleaning effect). The longer the service life of the microfibre product, the fewer products must be produced. This reduces the environmental impact from consumption of e.g., raw materials, energy, and chemistry. Here are quality standards for cleaning parameters and standards for procedure for washing. The number of washes compared with the continued high cleaning effect of the microfibre product can be used as an expression of the product's service life.
Waste and recycling	
Harmful chemicals	A high RPS for requirements for harmful chemicals in textiles and cleaning tools, making recycling of their materials desirable. However, because the textile parts are almost always a combination of different fibre types there is currently no realisable potential for fibre-to-fibre recycling.
Cleaning tools	An overall middle RPS has been found here. Reuse of cleaning tools saves resources. The textile part will have a shorter service life than the tool and must therefore be removable from the tool. This will also promote better recycling of the materials in the tool after its end of life. The materials of the cleaning tools must be able to be separated so the materials can be sorted for recycling. For cleaning tool parts in plastic there are also requirements that promote better quality of the recycled plastic.

2.3 Circular economy

To support a circular economy, it is important that products are of good quality, so they can last a long time. Therefore, there are requirements for durability and cleaning efficiency.

The materials in cleaning tools can be recycled at end of life. The chemicals used in the materials are important for the possibilities of recycling, and substances that are harmful to health and the environment must be as low as possible. Nordic Swan Ecolabelled supplies for microfibre based cleaning are subject to strict requirements concerning hazardous chemicals.

In addition, the actual types of materials can have an impact on the potential for recycling. Biodegradable plastic, for example, must not be used in Nordic Swan Ecolabelled products or their packaging, as it "contaminates" the other plastic streams that go into recycled plastic in the Nordic region. Also, the treatment can have an impact on the potential for recycling.

The criteria have requirements regarding a certain number of recycled materials (in textile fibres and in cleaning tools) in the Nordic Swan Ecolabelled product. For the recycled materials there are requirements concerning where these must originate from.

There are requirements regarding that the cleaning fabric must be able to be removed from the cleaning tool and that the cleaning tool must be able to be separated into different types of materials so that the materials can be recycled.

2.4 UN Sustainable Development Goals

The UN Sustainable Development Goals (SDGs) are a universal call to action to fight poverty and inequalities, protect the planet and tackle climate change by 2030.

Nordic Swan Ecolabelled supplies for microfibre based cleaning actively contribute to fulfilment of UN Sustainable Development Goal 12: "Ensure sustainable consumption and production patterns".

This is how Nordic Swan Ecolabelled supplies for microfibre based cleaning contribute to fulfilling SDG 12:

- Requirements that promote **sustainable management and efficient use of natural resources**, for example:
  - Wood raw materials must be certified sustainable and be traceable in the supply chain
  - Raw materials for bio-based plastics must be sustainably sourced
  - A certain amount of recycled polyester fibres must be used
  - Only plastics suited for recycling can be used
  - Water and energy efficiency technologies must be applied in textile production
- **Strict requirements for chemicals and emissions** in the textile production and the possibility to clean without cleaning chemicals reduce the

release of harmful substances to air and water. Thus, the Nordic Swan Ecolabel contributes to phasing out substances that are hazardous to health and the environment.
- Requirements for quality, durability and cleaning efficiency ensure long service life, thereby **reducing waste and saving resources**.
- The packaging must be designed so that the material can be **recycled** after use, thus supporting a circular economy.

How the Nordic Swan Ecolabel contributes to other UN Sustainable Development Goals:

Goal 3: Reduces the use of substances that are hazardous to health and the environment

- Strict requirements on chemicals in the textile production
- Products can be used without cleaning chemicals

Goal 6: Contributes to cleaner water and water saving

- Strict requirements on chemicals in the textile production
- Promotes water-saving technologies in the textile production
- Products can be used without cleaning chemicals

Goal 8: Protects labour rights

- ILO Core Conventions must be observed in textile production. For example, child labour and forced labour are prohibited

Goal 13: Requires efficient use of resources

- Promotes energy efficiency in the textile production
- Use of locally produced solar energy is rewarded

Goal 14: Prevents water pollution

- Strict requirements on chemicals in the textile production
- Products can be used without cleaning chemicals

2.5 Microplastics and fibre fragment loss

Textiles from synthetic fibres such as polyester are a source of microplastics when fibre fragments are detached from textiles. Microplastic can be harmful to

health and the environment[2,3] and Nordic Ecolabelling wishes to limit the release of microplastics from textiles. New standardized methods have just been developed to test for fibre fragment loss from textiles. However, there is still a lack of knowledge about which characteristics of textile production are most important for the release of microplastics. Therefore, it is difficult to set absolute requirements for the textile production itself.

Lack of knowledge

A major challenge has been the lack of standardised methods for examining fibre fragment loss/microplastics from textiles[4,5]. Such test methods are now ready and now there is a need for studies that collect and compare test results to find out what should be done. Both the fibre type, yarn properties, textile structure, brushing and cutting techniques can have a bearing on how much microplastics/fibre fragment is released from the fabrics. Fibre fragments/microplastics, can also be collected during the production process, for example after washing or by removing loose fibre fragments from dry fabrics[6,7]. Currently, there is a lack of knowledge about methods for this. Some microplastics from production as well as from washing machines are, however, retained in wastewater treatment plants[8,9,10].

All synthetic textiles shed microplastics. Very little is known about whether microfibre textiles are better or worse than other synthetic textiles. Nordic Ecolabelling now requires that microfibre textiles be tested for loss of fibre fragments and over time possibly comply with a requirement which exclude microfibre textiles with high fibre loss during washing.

Textiles made from cellulose fibres, such as cotton and regenerated cellulose fibre, also shed microfibres, and such microfibres have also been found in aquatic environments[11,12,13]. However, there is greater concern about plastic fibres

[2] Gaylarde C, Baptista-Neto JA, da Fonseca EM (2021) Plastic microfibre pollution: how important is clothes' laundering? Heliyon 7 e07105
[3] Henry B, Laitala K, Klepp IG (2018) Microplastic pollution from textiles: A literature review. Project report No. 1-2018. Oslo and Akershus University College of Applied Sciences.
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[7] http://oceancleanwash.org/solutions/ (04.02.2022)
[8] Habib RZ, Thiemann T, Al Kendi R (2020) Microplastics and wastewater treatment plants – a review. Journal of Water Resources and Protection 12:1–35.
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[10] Xu X, Hou Q, Xue Y, Jian Y, Wang LP (2018) Pollution characteristics and fate of microfibers in the wastewater from textile dyeing wastewater treatment plant. Water Science and Technology 78(10):2046–2054.
[11] Suaria G, Achtypi A, Perold V, Lee JR, Pierucci A, Bornman TG, Aliani S, Ryan PG (2020) Microfibers in oceanic surface waters: A global characterization. Science Advances 6(23): eaay8493.
[12] Savoca S, Capillo G, Mancuso M, Faggio C, Panarello G, Crupi R, Bonsignore M, D'Urso L, Compagnini G, Neri F, Fazio E, Romeo T, Bottari T, Spanò N (2019) Detection of Artificial Cellulose Microfibers in Boops Boops from the Northern Coasts of Sicily (Central Mediterranean). Science of the Total Environment 691:455–65.
[13] Woodall LC, Sanchez-Vidal A, Canals M, Paterson GLJ, Coppock R, Sleight V, Calafat A, Rogers AD, Narayanaswamy BE, Thompson RC (2014) The Deep Sea Is a Major Sink for Microplastic Debris. Royal Society Open Science 1(140317).

because they more easily attract environmental toxins, which are then transported with the fibres[14,15]. In addition, cellulosic fibres degrade.

Laundry requirements

Nordic Ecolabelling also sets requirements for textile services (laundries) to reduce microplastics release. Nordic Swan ecolabelled laundries are rewarded if they have installed filters that collect microplastics. Scientists and industry are constantly working to develop better filters.

Guidance of the consumer

Filters for washing machines for consumers have also been developed but have not become standard yet[16]. Washing bags that retain microplastics also exist, but research shows that they vary in how much they retain[17,18,19]. Good advice is to wash less often, use a front-feed washer and wash at a low temperature[20,21,22].

Research

The last years several major research projects on microplastics have been carried out, with researchers, organisations and the textile industry collaborating, and new projects are underway[23]. Efforts are being made both to identify the sources of release and how the environment is affected, and to develop better materials and production methods.

The Nordic Swan Ecolabel follows these projects and will continue to gather new knowledge. The Nordic Swan Ecolabel now requires microfibre textiles to be tested for loss of fibre fragments in accordance with either test method from TMC (The Microfibre Consortium) or standard ISO/DIS 4484-1. Nordic Ecolabelling can subsequently insert a limit value in the requirement during the period of validity of the criteria, when a relevant rating system with applicable limit values has been developed.

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[14] Gaylarde CC, Baptista-Neto JA, da Fonseca EM (2021). Nanoplastics in aquatic systems - are they more hazardous than microplastics? Environmental Pollution 272, 115950. .
[15] Wang F, Wang F, Zeng EY (2018) Chapter 7 - Sorption of Toxic Chemicals on Microplastics. In Zeng EY (ed.) Microplastic Contamination in Aquatic Environments. Elsevier, 225–247.
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[18] Kärkkäinen N, Sillanpää MK (2021) Quantification of different microplastic fibres discharged from textiles in machine wash and tumble drying. Environmental Science and Pollution Research 28(2):1–11
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[20] www.oceancleanwash.org/solutions/solutions-for-consumers (04.02.2022).
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[22] Hartline NL, Bruce NJ, Karba SN, Ruff EO, Sonar SU, Holden PA (2016) Microfiber Masses Recovered from Conventional Machine Washing of New or Aged Garments. Environmental Science & Technology 50(21):11532–38.
[23] Examples are projects led by the Swedish research institute Swerea www.swerea.se/en/MinShed, the Norwegian research institute SINTEF www.sintef.no/en/projects/microfibre-evaluating-the-fate-effects-and-mitigat/, the German industry organisation Bundesverband der Deutschen Sportartikel-Industrie e.V. http://textilemission.bsi-sport.de/.

3 Other labels

The global textile industry uses many different labels with a focus on health, the environment and working conditions. One explanation for the many types of labels may be the complex value chain, which makes it difficult for the manufacturer or Brand Owner to control every step back along the production chain. In this respect, labels that include third-party certification provide greater peace of mind regarding the product and the underlying production and pass credible information further up the value chain. Because textile production is known to be among the most environmentally impactful industries globally, there is strong demand to know that something is being done to reduce that environmental impact.

Some of the labels are type 1 ecolabels, such as the Nordic Swan Ecolabel, the EU Ecolabel, GOTS and Blue Angel. These assess the entire life cycle of the product and target requirements at the stages in the life cycle that have relevance and potential. These labels are based on the ISO 14024 standard and set requirements regarding the relevant environmental parameters for textiles. Other labels are raw material labels, such as the organic label, plus there are labelling schemes for social and ethical conditions, such as the Fairtrade label. There are also health labels that focus on the chemical content of the finished product, such as the OEKO-TEX standard 100.

The only type 1 ecolabel, which has criteria specifically designed for cleaning textiles with microfibres, is the Nordic Swan Ecolabel. Here requirements are set for all relevant parts of the life cycle of the cleaning textiles with microfibres e.g., materials, chemicals, production, cleaning efficiency and durability of the product. Also cleaning tools are included if they are to be used and sold together with the cleaning textile. For the tools there are requirements regarding materials, chemicals, and design for recycling of materials after end use.

4 Justification of the requirements

This section presents the requirements and explains the background to the requirements and the chosen requirement levels. The appendices referred to are those that appear in the criteria document “Nordic Swan Ecolabelling of Supplies for microfibre based cleaning".

4.1 Definition of the product group

The criteria for Nordic Swan ecolabelled supplies for microfibre based cleaning includes cloths, mops, pads, and other cleaning products containing microfibres (i.e., fibres less than 1 decitex (Dtex) thick) that are designed for dry and/or damp cleaning without the use of cleaning chemicals. There is no requirement for the amount of microfibre in a product, because fulfilment of the requirement for cleaning efficiency is the important part here. The cleaning products must be washable. The product group includes both products for private and for professional use.

Supplies for microfibre based cleaning may contain textile fibres other than microfibres. The criteria include both synthetic and natural fibres.

Also cleaning tools, such as mop handles and stands, are included but only if they are to be used and sold together with the microfibre product in the same packaging. It must be possible to remove the cleaning fabric from the cleaning tool. Cleaning tools cannot be ecolabelled separately.

Products that can be ecolabelled in accordance with other Nordic Swan Ecolabelling criteria are not covered by the Supplies for microfibre based cleaning. Most relevant are:

- Textiles that do not contain microfibres and have a cleaning purpose (criteria for textiles)
- Wet wipes (criteria for cosmetic products)
- Disposable products made from non-woven material that cannot be washed or reused, for example paper towels (criteria for tissue paper).

4.2 Definitions

Ingoing substances	All substances in the chemical product regardless of amount, including additives (e.g., preservatives and stabilizers) in the raw materials. Substances known to be released from ingoing substances (e.g., formaldehyde, arylamine, in situ-generated preservatives) are also regarded as ingoing substances.
Impurities	Residuals, pollutants, contaminants etc. from production, incl. production of raw materials, that remain in the chemical product in concentrations less than 100 ppm. Impurities in the raw materials exceeding concentrations of 1000 ppm are always regarded as ingoing substances, regardless of the concentration 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 in the requirement according to ISO 14021, which applies the following two categories: “Pre-consumer/commercial” is defined as material that is recovered from the waste stream during a manufacturing process. Materials that are reworked or reground, or waste that has been produced in a process, and can be recycled within the same manufacturing process that generated it, are not considered to be pre-consumer recovered material. Nordic Ecolabelling considers reworked, reground or scrap material that cannot be recycled directly in the same process, but requires reprocessing (e.g., in the form of sorting, remelting, and granulating) before it can be recycled, to be pre-consumer/commercial material. This is irrespective of whether the processing is done in-house or externally. “Post-consumer/commercial” 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.
Chemical recycling	The definition of chemical recycling used here includes processes in which the final product is either monomers, oligomers, or higher hydrocarbons. Processes with end-product in the form of naphtha or pyrolysis oils are not covered.
Recycled fibres	This covers both mechanical and chemical recycling of fibres and materials.
Nanomaterials	The European Commission’s definition from 18 October 2011 (2011/696/EU): Nanomaterials: A natural, incidental, or purposely manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for at least 50% of the particles in the number size distribution, one or more external dimensions are in the size range of 1–100 nm.
Genetically modified organisms (GMO)	Genetically modified organisms are defined in EU Directive 2001/18/EC.
Textile finishing	All the processes through which fabric is passed after bleaching and dyeing. Meaning processes such as printing, impregnating, or coating, as well as any other application of chemicals that change the property of the fabric (smoothness, drape, lustre, water repellence, flame retardancy or crease resistance, etc.).

Additive	Chemical products added to improve the performance, functionality, and ageing properties of the polymer. Examples of additives are plasticisers, flame retardants, antioxidants, light/heat/thermal stabilisers, pigments, antistatic agents, and acid scavengers.

4.3 Description of the product and the production chain

The product, material composition, manufacturing process, suppliers, production chain etc. must be described to aid the assessment of which requirements need to be met.

O1 Description of the product, material composition and limits

The applicant must submit the following information for each product:

- State product type (e.g., cloth, mop, pad), if cleaning tool is included, trade name/ item number, if the product is for consumer or professional.
- Confirmation that the product is not a single-use product.
- If cleaning tool is included: Illustration/photo of the product and a description of how it is possible to remove the cleaning fabric from the cleaning tool.
- For textile part: Have any of the textile parts been further processed after bleaching and dyeing and undergone finishing (see section 4.2 for definition) such as printing, impregnated or coated?
- Overview of materials and composition: Overview of all ingoing materials (e.g., polyester, cotton, aluminium, plastic etc.), including the following information for each material:
    a) Trade name/item number and material type.
    b) Supplier of the material.
    c) State if the material is for the textile part or the cleaning tool.
    d) Specify which textile fibres are microfibres and the thickness in decitex (Dtex).
    e) State if material is recycled* or biobased.
    f) For cleaning tool material: State if surface is treated or not, and type of surface treatment.
    g) Weight in g of the material in the product.
    h) % by weight of the material in the textile part and in the cleaning tool, respectively.

A material type that are present with a total amount of maximum 5% by weight of the product are exempt from the requirements**.

Material types that are not subject to any requirements in these criteria may account for no more than total 5% by weight of product**.

UHF (ultra-high frequency) and RFID (radio frequency identification) chips/tags are allowed and are not subject to any requirements in these criteria.

** See definition in section 4.2.*

*** Calculated separately for the textile part and for the cleaning tool, respectively.*

Overview of the materials, which must include the information required above.

If cleaning tool is included: Illustration or photo of the product.

Background to requirement

It is important that this information is entered correctly, as it determines which requirements are relevant for the licence in question.

A material (e.g., cotton, steel) that are present with a total amount of no more than 5% by weight of the product (calculated separately for the textile part and for the cleaning tool, respectively) are exempt from the requirements. As the requirements are comprehensive, going all the way back to the raw material supplier and require documentation of the chemicals used in the manufacturing processes, it possible for small amounts of materials to be exempt from the requirements, simplifying the application process.

UHF (ultra-high frequency) and RFID (radio frequency identification) chips /tags can be used for tracking the products e.g., at laundries. They are allowed to use and are not subject to any requirements.

Nordic Ecolabelling does not wish to promote the use of single use supplies for microfibre based cleaning products. The total environmental impact of products depends, in part, on how long they remain in use. Supplies for microfibre based cleaning products whose main function can only be used once are therefore not eligible for the Nordic Swan Ecolabel. The criteria for the Nordic Swan Ecolabelling of Supplies for microfibre based cleaning will instead encourage products that fit into a circular economy. Here, the focus is on a long use phase and materials that can be recycled.

O2 Description of the production chain and the manufacturing processes

The production and supply chain can be described using a flow chart, for example as shown in Appendix 1.

Manufacturing processes must be described. For each process the following information must be submitted:

- The manufacturing processes performed, e.g., textile fibre production, textile dyeing, textile finishing or powder coating
- The company name of the supplier who perform the process
- Production site (full address and country)

Submit a description of the production chain and the manufacturing processes (preferably in a flow chart), and state which suppliers perform each process. See the example in Appendix 1.

Submit an overview of manufacturing processes with information on the type of process, the company name, production location and contact person for each process performed. See the example in Appendix 1.

Background to requirement

To gain an overview of the production chain of the applied product, the applicant is required to provide information concerning production site, overview of manufacturing processes and suppliers. This is important to be able to assess which requirements in the criteria must be documented for each product.

4.4 Textile

This section covers requirements regarding the fibres, chemicals, and production of textile parts.

O3 Textiles certified with the Nordic Swan Ecolabel

If a textile part is certified with the Nordic Swan Ecolabel for textile, hide/skins, and leather (generation 5 or later), it is exempted from requirements in section 4.4.

The textile must not have been treated with chemicals after certification.

Trade name and licence number for the Nordic Swan Ecolabelled textile.

Declaration from the applicant that the textile has not been treated with chemicals after certification.

Background to requirement

Textiles that are certified according to the Nordic Swan Ecolabel cover the whole life cycle and meet ambitious requirements concerning the environment and health, and therefore other documentation for the mentioned requirements is not needed.

4.4.1 Textile fibres

The criteria cover the most common fibre types used in supplies for microfibre based cleaning.

A fibre type that are present with a total amount of maximum 5% by weight of the textile part are exempt from the requirements in section 4.4.1.

Textile fibres that are not subject to any fibre requirements in these criteria may account for no more than total 5% by weight of the textile part.

O4 Recycled fibres: Synthetic fibre – fossil origin

The recycled material* must not include recycled plastic from plants that are EFSA** or FDA*** approved as food contact material or marketed as compatible with these.

The traceability of the recycled raw material must be documented with either a or b below:

a) Global Recycled Standard certificate or Recycled Claim Standard certificate showing that the raw material is recycled, or other equivalent certification approved by Nordic Ecolabelling.

b) By stating the producer of the recycled raw material and documenting that the feedstock used in the raw material is 100% recycled material, see definition in requirement.

** See definition in section 4.2. However, for the definition of chemical recycling used here includes processes in which the end product is either monomers, oligomers or higher hydrocarbons. Chemical recycling processes where the end product of the chemical process is naphtha or pyrolysis oils (energy production) are not covered by the definition of "recycled material". Here, the process itself is considered a recovery rather than recycling.*

*** 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.*

Declaration from the producer of the recycled raw material that the raw material is not EFSA or FDA approved, see requirement.

- a) Certificate from an independent certifier of the supply chain (e.g., Global Recycled Standard or Recycled Claim Standard).

- b) Documentation from the producer, showing that the feedstock used in the raw material is 100% recycled material, see definition in requirement.

Background to requirement

Substantial environmental potential is expected in the future with regard to reduced resource consumption and CO_2 emissions[24], if the textile industry is able to convert textile waste into new raw materials. However, today fibre-to-fibre recycling remains limited for textiles[25], and recycled polymers from other synthetic materials such as plastics are often used today. The requirement therefore accepts both fibre-to-fibre recycling and polymer-to-fibre recycling. Nordic Ecolabelling wishes to stimulate increased use of recycled materials in textile production, thus avoiding the use of virgin fossil materials. It is currently reasonably possible to use recycled material for fibre types such as polyester and polyamide, but the same options are not as widely available for other fibre types yet (August 2019).

The requirement therefore seeks to encourage fibre types, that can make use of recycled feedstock. Advancements are being made in this area all the time and the possibility of using recycled feedstock may therefore change over time.

Prohibition on the use of re-granulate resulting from reprocessing processes that have obtained an approval pursuant to Commission Regulation (EC) No 282/2008 on recycled plastics materials and articles intended for food contact or approval pursuant to Regulation (EC) No 282/2008 to the Code of Federal Regulations Title 21: Food and Drugs, PART 177 — INDIRECT FOOD ADDITIVES: POLYMERS. These are both approvals for the material to be used for food contact. It is not desirable for textile production to use processed, recycled raw materials approved for food packaging production. Plastic materials approved for food packaging require the highest traceability and purity of the plastic raw material and it will therefore be down cycling to use this plastic for anything other than food contact products.

The requirement states that the feedstock used in the recycled raw material must be traceable. Without traceability, it is difficult to ensure that the material really is recycled. Traceability can be documented with a certificate from a third-party certifier of the supply chain, such as the Global Recycled Standard, for example. The Global Recycled Standard (GRS) is an international, voluntary standard that sets requirements for third-party certification of recycled content and chain of custody in the supply chain. This standard restricts the use of undesirable chemicals in the manufacture of new products, but the standard does not cover chemicals that may enter via the recycled materials, and thus gives no guarantee about what may be present in the finished GRS product[26] (see more on undesirable chemicals in recycled materials in requirement O5). Alternatively,

[24] Sandin, G, Environmental impact of textile reuse and recycling – A review, Journal of Cleaner Production Volume 184, 20 May 2018, Pages 353-365.
[25] PULSE OF THE FASHION INDUSTRY, Global Fashion Agenda & The Boston Consulting Group 2017.
[26] Global Recycled Standard http://textileexchange.org/wp-content/uploads/2017/06/Global-Recycled-Standard-v4.0.pdf

traceability may be documented by the producer of the recycled raw material declaring that 100% recycled feedstock has been used.

O5 Recycled fibres/raw materials: Test for environmentally harmful substances

Recycled fibres/raw materials for fibre production shall not contain the following substances above the limits stated in the table below.

This requirement applies to all recycled fibres – both synthetic and natural and must be documented annually with either a) or b):

a) an Oeko-Tex standard 100 class II certificate

b) test report showing that the requirement is complied with.

Exemption to the requirement:

- Material from PET bottles original approved for food contact.
- Fibres from chemically recycled* polymers, if it can otherwise be documented that the process ensures, that the requirement limits are complied with.
- Fibres used in the production of regenerated cellulose.
- Fibres, where it can be documented that they originate from type I eco-labelled products.

** The definition of chemical recycling used here includes processes in which the end product is either monomers, oligomers or higher hydrocarbons. Chemical recycling processes where the end product of the chemical process is naphtha or pyrolysis oils (energy production) are not covered by the definition of "recycled material". Here, the process itself is considered a recovery rather than recycling.*

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

Substance/substance group	Max. limit
Extractable metals	
Chromium total	2.0 mg/kg
Lead	1.0 mg/kg
Mercury	0.02 mg/kg
Cadmium	0.1 mg/kg
Antimony	30.0 mg/kg
Organic tin compounds	
TBT and TPhT	1.0 mg/kg
Total of DBT, DMT, DOT, DPhT, DPT, MOT, MMT, MPhT, TeBT, TeET, TCyHT, TMT, TOT, TPT	2.0 mg/kg
Chlorophenols	
Pentachlorophenol	0.5 mg/kg
Tetra chlorophenol	0.5 mg/kg
Trichlorophenol	2.0 mg/kg
Dichlorophenol	3.0 mg/kg
Mon chlorophenol	3.0 mg/kg
Per- and polyfluorinated compounds	
PFOS, PFOSA, PFOSF, N-Me-FOSA, N-Me-FOSE, N-Et-FOSE	Total 1.0 µg/m^2
PFOA and salts	0.025 mg/kg
PFHpA, PFNA, PFDA, PFUdA, PFDoA, PFTrDA, PFTeDA	0.1 mg/kg for each
Phthalates	
BBP, DBP, DEP, DMP, DEHP, DMEP, DIHP, DHNUP, DCHP, DHxP, DIBP, DIHxP, DIOP, DINP, DIDP, DPrP, DHP, DNOP, DNP, DPP	Total 0.05 weight%

Flame retardants	
Flame retardants, except for flame retardants approved by Oeko-Tex	10 mg/kg for each Total 50 mg/kg
Formaldehyde	75 mg/kg
Arylamines with carcinogenic properties stated in Oeko-Tex 100 Annex 5	Total 20 mg/kg
Surfactant, wetting agent residues	
Nonyl phenol, octyl phenol, heptyl phenol, pentyl phenol	Total 10 mg/kg
Nonyl phenol, octyl phenol, heptyl phenol, pentyl phenol, nonyl phenol ethoxylate and octyl phenol 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 50 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 1.0 mg/kg
For elastane, polyurethane, and polyamide	
DMAc	0.05 weight% solvent residue

Test methods: as stated in Testing Methods Standard 100 by Oeko-Tex.

- Test reports or Oeko-Tex 100 class II certificate showing fulfilment of the requirement. A written procedure showing how an annual test is performed in line with the requirement, along with annual in-house checks of compliance with the requirement. Alternatively, a procedure for annual requisition of Oeko-tex 100 class II certificate. Test results/certificate are to be archived and kept available for inspection by Nordic Ecolabelling.

- When using chemically recycled polymers documentation showing that the recycling process ensures that the requirement is complied with.

- When using the exemption for material from PET bottles, this must be documented by the fibre supplier.

- When using an exemption for fibres from earlier type I ecolabelled textiles, this must be documented by the fibre supplier.

Background to requirement

It is important to consider the potential exposure 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[27]. This applies to both fibres recovered from used textiles and fibre recovered from products other than textiles e.g., plastic products. Even if the textile is washed several times, unwanted chemicals may still be present in the

[27] IKEA and H&M analyse 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

recycled fibre. In mechanical recycling processes, all the chemical substances remain in the material and may be transferred to the new textile fibre[28]. In chemical recycling processes such as pyrolysis and gasification - the plastic as well as most of their additives and any contaminants are converted into basic chemicals. For other recycling processes such as depolymerization, where the chemical structures are preserved, it can not necessarily be ensured that no harmful additives and contaminants from the incoming plastic waste are included. 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[29].

O6 Synthetic fibre: Bio-based origin

Synthetic fibres from bio-based origin must contain at least 90% bio-based raw material, documented by testing in accordance with ISO 16620, ASTM D6866 or equivalent standard.

Raw materials used in the production of bio-based polymer fibres (e.g., polyester and polyamide) must meet the following requirements:

Palm oil and soy

Palm oil, soybean oil and soy flour must not be used for bio-based polymer fibre in the textile.

Sugar cane

The raw materials must meet either a) or b):

a) Waste* or residual products** defined in accordance with (EU) Renewable Energy Directive 2018/2001. There must be traceability back to the production / process where the residual production occurred.

b) Sugar cane must not be genetically modified*** and must be certified according to a standard that meets the requirements described in Appendix 3.

The producer of the bio-based polymer must have a chain of custody (CoC) certification according to the standard by which the raw material is certified. Traceability must at least be ensured by mass balance. Book and claim systems are not accepted.

The producer of the bio-based polymer must document its purchase of certified raw materials for polymer production, for example in the form of specifications on an invoice or delivery note.

Other raw materials

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

[28] Nordic Council of Ministers (2016). Gaining benefits from discarded textiles: LCA of different treatment pathways.
[29] M. Whitt, Survey of heavy metal contamination in recycled polyethylene terephthalate used for food packaging, Journal of Plastic Film & Sheeting 2012.

The raw materials must meet either c) or d):

c) Waste* or residual products** defined in accordance with (EU) Renewable Energy Directive 2018/2001. There must be traceability back to the production/process where the residual production occurred.

d) Primary raw materials (e.g., corn), not genetically modified***. Here geographical origin (country/state) must be stated.

** Waste as defined by EU Directive 2018/2001/EC.*

*** Residual products as defined by EU Directive 2018/2001/EC. Residues come from agriculture, aquaculture, fisheries, and forestry, or they can be processing residues. A processing residual product is a substance that is not one of the end products that the production process directly strives for. Residues must not be a direct target of the process and the process must not be changed to intentional production of the residual product. Examples of residual products are e.g., straw, husks, pods, the non-edible part of maize, manure, and bagasse. Examples of processing residues are e.g., raw glycerine or brown lye from paper production. Palm Fatty Acid Distillate (PFAD) from palm oil is not considered a residual/waste product and can therefore not be used.*

**** See definition in section 4.2.*

- Test according to ISO 16620, ASTM D6866 or equivalent standard showing content of bio-based raw material.

- Declaration by the producer of the polymer, that palm oil (incl. PFAD (Palm Fatty Acid Distillate)) soybean oil and soy flour are not used as raw materials for the bio-based polymer.

- For waste and residual products: Documentation from the polymer producer which shows that the requirement's definition of waste or residual products is met, as well as traceability which shows where the waste or residual product comes from.

- Sugar cane: Indicate which certification system sugar cane is certified for. A copy of a valid CoC certificate or a certificate number. Documentation such as an invoice or delivery note from the producer of the bio-based polymer, showing the purchase of bio-based polymer from certified raw material in at least the same annual quantity as is used in the production of the bio-based polymer. Declaration stating that the sugar cane has not been genetically modified.

- For primary raw materials: Declaration by the producer of the polymer stating that raw materials have not been genetically modified according to the definition in the requirement. Name (in Latin and English) and geographical origin (country/state) of the primary raw materials used.

Background to requirement

The requirement has been set to ensure that the renewable raw materials used do not originate from agricultural land created from the destruction of rainforest or the clearance of other valuable ecosystems. In terms of resources, the requirement promotes the use of renewable raw materials over virgin fossil materials. It is, however, important that the bio-based raw materials are grown sustainably. Even renewable raw materials may be associated with environmental and social problems.

There are several examples of bio-based polyester on the market, including Virent's BioFormPX paraxylene[30] and Ecodear® PET[31]. However, not all the mentioned bio-based polyester products meet the requirement here for at least 90% biomass in the polymer. It is not clear which biomass is used for these particular fibres but starch and sugar from sugar cane, sugar beet and maize are often used for the production of bio-based polymers. Starch currently accounts for 80% of the feedstock for biopolymers[32]. Castor oil, or oils such as soya or palm oil tend to be used to produce bio-based polyamide.

The establishment of palm oil plantations is one of the main causes of rainforest destruction, which threatens the existence of indigenous peoples, plants, and animals. Rainforests are particularly important for biodiversity, as they are the most species-rich ecosystems on the planet[33]. Soya beans are grown on land that is often established in the place of rainforest and savannah in South America. Soya production is one of the greatest threats to the rainforest on the American continent, particularly in the southern Amazon[34]. Based on this, palm oil, soybean oil and soy flour are banned as raw materials for bio-based polymers.

The most ideal is to use waste or residual products from i.e., agriculture, fishing, forestry or processing residual product defined in accordance with (EU) Renewable Energy Directive 2018/2001. By using waste or residual products as raw materials, you use parts that are not used as food. PFAD (Palm Fatty Acid Distillate) from palm oil is not considered a waste or residual product and may 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.

There are requirements for traceability, which shows where the waste or residual products comes from. In EU Directive 2018/2001/EC, "the point of collection" is described as the point where waste or residual product occurs for the first time (i.e., for used cooking oil, the starting point will be the restaurants or production sites that produce the fried food). The traceability of this requirement must start at the point where waste or residual product occurs for the first time.

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 several requirements for i.e., 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.

[30] http://www.virent.com/news/virent-bioformpx-paraxylene-used-to-produce-worlds-first-100-plant-based-polyester-shirts/ accessed 20.02.2019.
[31] https://www.toray.com/products/fibers/fib_0131.html accessed 20.02.2019.
[32] https://aboutbiosynthetics.org/feedstock-to-fashion/ accessed 20.02.2019.
[33] OLSEN LJ, FENGER NA & GRAVERSEN J 2011. Palm oil – Denmark's role in the global production of palm oil. WWF Report DK. WWF Worldwide Fund for Nature, Denmark.
[34] http://www.worldwildlife.org/industries/soy, (27.01.2016).

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. Primary raw materials incl. sugar cane must not be genetically modified.

The requirement prohibits the use of genetically modified agricultural raw materials in bio-based polymer fibre. Process chemicals and raw materials, e.g., proteins, which are produced using genetically modified microorganisms in closed systems, are not themselves GMOs or genetically modified, and Nordic Swan Ecolabeling do not consider such production as problematic.

Research results have not clearly shown that today's GMO crops contributes to development towards sustainable agriculture with less use of pesticides. At the same time research on long-term effects of genetically modified plants, both environmental and socio-economic consequences, is lacking. There are potential adverse effects of GMOs along the entire value chain from research and development of plants, through cultivation, to storage, use and waste management[35,36,37]. In several of these stages, there is a lack of scientific studies, and a lack of assessment of the overall picture[38]. Today's GMOs are also adapted to industrial agriculture with companies that have obtained a monopoly-like position, and Nordic Ecolabelling wants to help limit the negative consequences of this.

O7 Polyamide

Polyamide must meet either a) or b):

a) Minimum 20 % by weight of the polyamide fibres must comprise of recycled material (see definition of recycled material in O4).

   Recycled material must also fulfil requirement O4 and O5.

b) For nylon 6 and nylon 6,6 the emissions to air of N_2O during monomer production, expressed as an annual average, must not exceed 9,0 g N_2O/kg.

a: Documentation as described in requirement O4 and O5. And calculation showing that minimum 20 wt% of the polyamide fibres are recycled.

or

b: A declaration from the producer of the polyamide fibre or a test report (test method: ISO 11564 or equivalent method) showing that the requirement for max. 9.0 g N_2O/kg as an annual average is fulfilled. The analysis laboratory must fulfil the requirements in Appendix 2.

or

Alternatively, a valid EU Ecolabel (Commission's decision from 2014) or Blue Angel (DE-UZ 154, 2017) certificate may be used as documentation.

[35] Catacora-Vargas G (2011): "Genetically Modified Organisms – A Summary of Potential Adverse Effects Relevant to Sustainable Development. Biosafety Report 2011/02, GenØk – Centre for Biosafety.
[36] Fischer et al. (2015) Fischer et al. (2015): Social impacts of GM crops in agriculture: a systematic literature review. Sustainability 7:7.
[37] Catacora-Vargas G et al. (2018): Socio-economic research on genetically modified crops: a study of the literature. Agriculture and Human Values 35:2.
[38] Kolseth et al (2015) Influence of genetically modified organisms on agro-ecosystem processes. Agriculture, Ecosystems and Environment. 214 (2015) 96–106.

Background to requirement

Recycled polyamide:

Polyamide (PA, nylon) can be recycled via the mechanical or chemical processing of nylon waste, A comparative LCA study of virgin nylon and recycled nylon for carpet manufacturing, conducted for Shaw Carpets (2010) and reviewed by LBP-GaBi University of Stuttgart, highlights significant environmental benefits from the use of recycled nylon. There are, however, still only a limited number of recycled nylon suppliers.

The two commercial polyamide products are polyamide 6.6 and polyamide 6. Polyamide 6.6 is created through the polymerisation of adipic acid and hexamethylenediamine, while polyamide 6 (Nylon 6) is created through the polymerisation of melted ε-caprolactam.

Nitrogen dioxide (N_2O) is a greenhouse gas that is 270 times more potent than carbon dioxide. Nitrogen dioxide also depletes the ozone layer. The two greatest industrial sources of N_2O are the production of nitric acid (HNO_3) and adipic acid. Adipic acid is created in a two-stage process where HNO_3 is used in the second stage and is the cause of the N_2O emissions. Adipic acid is primarily used in the production of polyamide. Emissions of N_2O have been reduced in recent years through thermal and catalytic cracking, especially in the production of adipic acid.

As the requirement for N_2O emissions is like the textile requirements in the EU Ecolabel (2014) and Blue Angel (2017) a valid certificate from these ecolabels can also be used as documentation.

O8 Polyester

Minimum 30 % by weight of the polyester fibres must either be composed of recycled material* (see definition of recycled material in O4) or be bio-based. Recycled material must fulfil requirement O4 and O5. Bio-based material must fulfil requirement O6.

For the remaining part of the polyester fibres the amount of antimony in the polyester fibre must not exceed 260 ppm.

- Recycled fibres: Documentation as described in requirement O4 and O5.
- Bio-based fibres: Documentation as described in requirement O6.
- A declaration from the producer of the polyester fibre that antimony is not used or a test report showing that the antimony requirement is fulfilled. Test method: Direct determination by atomic absorption spectrometry (AAS) or equivalent test method. The analysis laboratory must fulfil the requirements in Appendix 2.

Background to requirement

The main source of recycled feedstock for polyester fibre is currently rPET from used water bottles. PET may be recycled both mechanically and chemically[39]. An LCA conducted for the Nordic Council of Ministers[40] describes the environmental

[39] Ragaert, K. Mechanical and Chemical Recycling of Solid Plastic Waste, 2017 Waste Management publication.
[40] Nordic Council of Ministers (2016). Gaining benefits from discarded textiles: LCA of different treatment pathways.

effects of chemical recycling of PET. The analysis shows that chemical recycling is better than incineration of PET, in terms of the following impact categories: climate change, water consumption and total energy consumption, but is worse than incineration when it comes to eutrophication and photochemical ozone creation potential. Several other studies confirm this result. A point is also made about uncertainty linked to data sets originating from the Teijin factory in Japan – one of the only commercial plants in operation today, where waste polyester products are chemically processed into new polyester filament fibres under the brand name ECO CIRCLE™ FIBERS. Teijin also produces rPET from PET bottles for polyester staple fibre and textiles under the brand name EcoPET[41].

Right now, there is a development in chemical recycling and here is a potential to be able to completely change the PET economy, so that all forms of PET in the future can be recycled and fibre-to-fibre[42].

Polyester usually contains antimony in concentrations of 150-350 ppm (mg/kg)[43]. In the EU Ecolabel criteria work from 2001-2002 it was found, through information on «best available technology» (BAT) and the PET fibre industry, that 260 ppm was a suitable basic level for EU Ecolabel, with a best level called «antimony free». Since the diantimontrioxide (Sb_2O_3) content in finished PET can vary somewhat, the requirement should be set as an average over a period of several months or a year.

O9 Polypropylene

The use of lead-based pigments is prohibited.

A declaration from the producer of the polypropylene fibre that lead-based pigments is not used.

Background to requirement

Lead chromate/molybdate is used as both a stabiliser and pigment (plastic additive) in thermoplastic products. Pigments based on lead chromate/molybdate are for example used in some types of plastics such as polypropylene.

O10 Polyurethane

The fibres must comprise of 100% recycled material (see definition in O4) and must fulfil requirement O4 and O5.

Exception:

For fibres that are STANDARD 100 by OEKO-TEX (annex 4 class II) certified, an exception is given for up to 10% polyurethane fibres in the textile part.

See requirement O4 and O5.

If exception is used: STANDARD 100 by OEKO-TEX (class II) certificate for the polyurethane fibres.

Background to requirement

Elastane fibres based on recycled material are still not widespread. Therefore, an exception has been inserted for elastane fibres for up to a maximum of 10%

[41] Nordic Council of Ministers (2016). Gaining benefits from discarded textiles: LCA of different treatment pathways.
[42] Chemical Recycling, Making Fiber-to-Fiber Recycling a Reality for Polyester Textiles, GreenBlue 2018 hentet fra https://greenblue.org/work/chemical-recycling/
[43] Miljøstyrelsen, Miljøprojekt nr. 892, 2004, Antimon - forbrug, spredning og risiko.

elastane fibres in the textile part if the elastane fibre instead is STANDARD 100 by OEKO-TEX (annex 4 class II) certified.

O11 Cotton fibres

The requirement applies if cotton and other natural seed fibres of cellulose are included with more than 10% by weight in the textile part.

Cotton and other natural seed fibres of cellulose (including kapok) shall not come from GMO (genetically modified organisms)* and must be one of the following:

- recycled*
- organically cultivated**
- cultivated according to standard BCI (Better Cotton Initiative)
- cultivated according to standard CmiA (Cotton made in Africa)
- cultivated according to standard Fairtrade for cotton

The proportions of the different types of certified cotton must add up to 100% and all documentation shall reference the Control Body or certifier of the different standards.

Documentation that BCI cotton does not contain material from GMO shall be documented with either a) or b):

a) A yearly test of the raw cotton in accordance with test method ISO/IWA 32:2019 or equivalent.

b) Only for countries where genetically modified cotton varieties are forbidden to grow: documented traceability back to the cultivation and a declaration that no genetically modified cotton varieties have been cultivated.

Cotton certified via CmiA and Fairtrade cotton does not need to be tested, as long as these schemes exclude the use of genetically modified cotton.

** See definition in section 4.2.*

*** Organic cotton means cotton 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.*

Recycled fibres: Fulfilment of the requirement is documented for recycled fibre with either a) and/or b) below:

a) Certificate showing that the raw material is 100% recycled (post- and/or pre-consumer) with Global Recycled Standard certificate 4.0 (or later versions), Recycled Claim Standard (RCS) or other equivalent certification approved by Nordic Ecolabelling.

b) Present documentation demonstrating that the recycled fibre was purchased as 100% recycled (post- and / or pre-consumer) and state the supplier.

Organic cotton: Valid certificate showing that the cotton 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.

- BCI, CmiA or Fairtrade cotton: Documentation showing that the cotton is grown within one of the three standards BCI, CmiA or Fairtrade cotton. All documentation shall reference the Control Body or certifier of the different forms of cotton and be documented:
  - on an annual basis for purchased cotton with transaction records and/or invoices, or
  - on a final product basis (by weight) measured at spinning and/or fabrication.
- Yearly test report showing that the BCI raw cotton does not contain material from genetically modified cotton and procedure demonstrating that how a yearly test is done.
- Alternative to test for BCI cotton: Declaration that cotton originates from countries with a ban on genetically modified cotton as well as documentation showing that the purchased cotton can be traced back to the BCI farmers.

Background to requirement

Cultivation of cotton is linked to serious health and environmental problems caused using pesticides, fertilisers, irrigation water and monocultures[44,45,46]. Pesticides for cotton cultivation accounted for 5.7% of global pesticide sales and 16.1% of insecticide sales in 2014. The environmental impacts of cotton production vary between countries and production systems. Production ranges from highly mechanised in Australia, Brazil and the US to smallholder farms or a mixture of scales in for example India, China, and African countries.

Organic cultivation:

The environmental impact can be reduced through organic cultivation, which does not use synthetic pesticides and fertilisers, and does not permit genetically modified cotton. One of the environmental problems that organic production does not resolve is the issue of irrigation. Much of today's organic cultivation takes place in areas where rainwater is the main water source, something that reduces the problems associated with water consumption[47]. Although organic production does not necessarily deliver reduced water consumption, the quality of run-off water is significantly better for both people and the natural environment. It is difficult to say whether there is any difference in yield when comparing non-organic and organic cotton production. One of the reasons for this is that there are already major yield variances within the individual systems. Various studies suggest that IPM has the highest yield of the three cultivation methods, and that around 20% of global cotton production is IPM[48].

[44] Pesticide Action Network UK (2018) Is cotton conquering its chemical addiction? A review of pesticide use in global cotton production. https://issuu.com/pan-uk/docs/cottons_chemical_addiction_-_update?e=28041656/62705601
[45] European Commission, Joint Research Centre (2013) Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Textile Products – Technical report and criteria proposal, Working document, Institute for Prospective Technological Studies (IPTS).
[46] Kooistra K, Termorshuizen A, Pyburn R (2006) The sustainability of cotton – consequences for man and the environment. Wageningen University & Research, report no. 223.
[47] "The sustainability of cotton – consequences for man and the environment", Kooistra K., Termorshuizen A and Pyburn R., Wageningen University & Research, report no. 223, April 2006.
[48] 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.

Integrated pest management (IPM):

Integrated pest management (IPM) and agro-ecological practises can reduce pesticide use. IPM means that growers must consider all available pest control techniques, for example biological control, crop rotation and resistant varieties, and pesticides must be the last choice. Training of farmers and use of protective equipment are also important.

The sustainability standards Fairtrade, CmiA and BCI encourage IPM and prohibit certain hazardous pesticides, including those on the Stockholm Convention and Rotterdam Convention lists and those classified by WHO as 1a and 1b. Genetically modified cotton affects pesticide use too and is prohibited in organic agriculture, Fairtrade and CMiA, but allowed in BCI. Therefore, for BCI cotton a genetic test of the cotton for every batch purchased is required as documentation. The test must be performed to standard IWA 32:2019, a relatively new test that can identify the presence of genetically modified raw cotton.

The share of the total area of cotton harvested globally in 2019 was for BCI 12.6 %, CmiA 4.2%, organic 1.1% and Fairtrade 0.1%[49]. Because the supply of organic cotton is low and it is more expensive, many textile producers prefer conventional cotton to be more competitive.

Recycled cotton fibre:

This is cotton fibre that is recovered from used clothing and textiles from consumers or industrial waste (post- or pre-consumer textile waste). Industrial textile waste may be surplus material from the production of yarns, textiles, and textile products, for example selvedge from weaving and fabric remnants from factory cutting rooms. The textiles are stripped and pulled into fibres, which are then carded and spun into new yarn. Recycled cotton may also be blended with virgin fibres to improve yarn strength[50].

GMO:

GMO is a highly debated topic, and several countries have banned cultivation of GMOs. Topics discussed are food security, land use, lack of scientific knowledge about effects under local agricultural/forest conditions and risk of adverse effects on health and the environment.

Nordic Ecolabelling emphasises the precautionary principle and bases its position on regulations that have a holistic approach to GMOs. This means that sustainability, ethics, and benefit to society must be emphasised 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 are propagated in nature. Nordic Ecolabelling believes that GMOs should be assessed on a case-by-case basis.

[49] International Trade Centre (ITC), International Institute for Sustainable Development (IISD), Research Institute of Organic Agriculture (FiBL), State Secretariat for Economic Affairs (SECO) (2021) State of Sustainable Markets 2021 https://standardsmap.org/en/trends
[50] Wikipedia - Cotton recycling, https://en.wikipedia.org/wiki/Cotton recycling (accessed 26.08.2019).

Research has not clearly shown that today's GMOs contribute towards sustainable agriculture with less use of pesticides, and there is a lack of research into long-term consequences of GMOs, both environmental, social, and economic consequences.

There are potential adverse effects of GMOs along the entire value chain from crop research and development, through cultivation, storage, use and waste management[51]. In several of these stages, there is a lack of scientific studies, and there is a lack of holistic assessment[52,53,54,55]. Today's GMOs are also adapted to industrial agriculture with companies that have obtained a monopoly-like position, and Nordic Ecolabelling wishes to contribute to limiting the negative consequences of this.

Genetically modified cotton is grown primarily in India, the United States, China, and Australia. Most common is Bt cotton, which produces a substance that is toxic to certain insect pests. Despite years of use there is still uncertainty about the long-term ecological consequences[56],[57]. In several countries and regions, insects have become resistant to the toxins produced by the cotton plants, but it varies how long it has taken[58,59]. In India, Bt cotton was first used in 2002. Up to 2006, less insecticide was used overall (amount of active ingredient per hectare) because Bt cotton fought the most common insect pest[60]. However, due to spraying against other insect pests, the use of insecticides increased overall again until 2013, and after 2015 resistant insects have also become a problem[61]. In Australia, integrated pest management was used from the 1990s, which probably contributed to delaying resistance. The use of insecticides in Australia has decreased, first in Bt cotton and then in non-organic cotton, but the use of herbicides has not been reduced[62].

[51] Catacora-Vargas G (2011): "Genetically Modified Organisms – A Summary of Potential Adverse Effects Relevant to Sustainable Development. Biosafety Report 2011/02, GenØk – Centre for Biosafety.
[52] Catacora-Vargas G (2011): Genetically Modified Organisms – A Summary of Potential Adverse Effects Relevant to Sustainable Development. Biosafety Report 2011/02, GenØk – Centre for Biosafety.
[53] Kolseth et al (2015) Influence of genetically modified organisms on agro-ecosystem processes. Agriculture, Ecosystems and Environment. 214 (2015) 96–106.
[54] Fischer et al. (2015) Fischer et al. (2015): Social impacts of GM crops in agriculture: a systematic literature review. Sustainability 7:7.
[55] Catacora-Vargas G et al. (2018): Socio-economic research on genetically modified crops: a study of the literature. Agriculture and Human Values 35:2.
[56] Venter HJ, Bøhn T (2016) Interactions between Bt crops and aquatic ecosystems: A review. Environ Toxicol Chem 35(12):2891–2902.
[57] Kolseth et al (2015) Influence of genetically modified organisms on agro-ecosystem processes. Agriculture, Ecosystems and Environment. 214 (2015) 96–106.
[58] Blanco CA et al. (2016) Current situation of pests targeted by Bt crops in Latin America. Curr Opin Insect Sci 15:131–8.
[59] Tabashnik BE, Brévault T, Carrière Y (2013) Insect resistance to Bt crops: lessons learned from the first billion acres. Nature Biotechnology 31:6.
[60] Pesticide Action Network UK UK (2017) Is cotton conquering its chemical addiction. A review of pesticide use in global cotton production. http://issuu.com/pan-uk/docs/cottons_chemical_addiction_-_final_?e=28041656/54138689.
[61] Pesticide Action Network UK UK (2017) Is cotton conquering its chemical addiction. A review of pesticide use in global cotton production. http://issuu.com/pan-uk/docs/cottons_chemical_addiction_-_final_?e=28041656/54138689.
[62] Pesticide Action Network UK UK (2017) Is cotton conquering its chemical addiction. A review of pesticide use in global cotton production. http://issuu.com/pan-uk/docs/cottons_chemical_addiction_-_final_?e=28041656/54138689.

O12 Regenerated cellulose fibre: Recycled textile fibre

The requirement applies if regenerated cellulose fibres are included with more than 10% by weight in the textile part.

Raw materials for regenerated cellulose fibres must meet either requirement O12 for recycled textile fibre or O13 for wooden fibre materials, respectively. A fibre which is based on raw materials from a combination of requirements O12 and O13 can also be approved if the different raw materials each meet their own requirements.

Recycled raw materials to produce new regenerated cellulose fibres must be pre-consumer or post-consumer* cellulosic material.

It must be documented that 100% is recycled material.

The traceability of the recycled raw material must be documented with a certificate from either the Global Recycled Standard (version 4 or later) or the Recycled Claim Standard (version 2 or later).

** See definition in section 4.2.*

Certificate from either Global Recycled Standard (version 4 or later) or Recycled Claim Standard (version 2 or later) documenting, that the raw material has been recycled.

Documentation showing that 100% of the raw material has been recycled.

When using a mixture of virgin and recycled raw material: Documentation which shows that 100% of the raw material meets either requirement O12 or O13.

Background to requirement

Regenerated cellulose fibres can be used for textiles such as viscose and rayon. This requirement promotes the use of recycled cellulose-based textiles, as a raw material to produce new regenerated cellulose fibres. It is positive for the environment and contributes to the circular economy.

Recycled material is defined as pre-consumer and post-consumer waste according to ISO 14021. As documentation for the material to be traced as recycled, certificates from Global Recycled Standard (version 4 or later) or Recycled Claim Standard (version 2 or later) must be used. The minimum requirement for recycled fibre is only 5% for Recycled Claim Standard and 20% in Global Recycled Standard. Hence the proportion of recycled material must also be documented to be 100%.

The requirement can be combined with the following requirements if the material of the regenerated cellulose fibre is a combination of recycled cellulosic textile waste and cellulose fibres, that comes from wood fibres that meet the requirement O13.

O13 Regenerated cellulose fibre: Limitation of tree species

The requirement applies if regenerated cellulose fibres are included with more than 10% by weight in the textile part.

Raw materials for regenerated cellulose fibres must meet either requirement O12 for recycled textile fibre or O13 for wooden fibre materials, respectively. A fibre which is based on raw materials from a combination of requirements O12 and O13 can also be approved if the different raw materials each meet their own requirements.

The requirement only applies to virgin wood fibres and must be documented either by the manufacturer of regenerated fibres or the manufacturer of the dissolving pulp and the manufacturer of regenerated fibres.

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

a) CITES (Appendices I, II and III)

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

c) Rainforest Foundation Norway´s tree list

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

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

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

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

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 tree species is located on the website: http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements-2020/*

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

or

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

The applicant/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

Several tree species are restricted or not permitted for use in cleaning tools. The requirement applies only to virgin forest tree species and not tree species defined as recycled material according to ISO 14021.

The list of restricted tree species is based on the wood species that are relevant to Nordic Ecolabelling's criteria, i.e., tree species that have the potential to be included in Nordic Ecolabelled products. Listed tree species are indicated by the scientific name and the most common trade names. The scientific name/trade name is not always adequate, as there may be more than one scientific name/trade names for the listed tree species than the list indicates.

Criteria for tree species found in the list are wood originating from:

a) Tree species listed on CITES Appendices I, II and III.
b) IUCN red list, categorized as critically endangered (CR), endangered (EN) and vulnerable (VU).
c) Regnskogsfondet (Rainforest Foundation Norway) tree list
d) Siberian larch (originated in forests outside the EU)

CITES is an international convention for the control of trade (across borders) of wild fauna and flora. CITES includes around 5600 animal species and around 28.000 plant species wherein a part is relevant timber tree species (mainly tropical species). The tree species is, dependent on how threatened they are, listed in Appendix I, II or III. Species listed in Appendix I, are highly endangered and trade with these species is totally banned. For the remaining tree species, special permits for import and export are required (Appendices II and III). CITES is regulated by EU legislation (Council Regulation (EC) No 338/97) and trees with valid CITES permits are considered to be legally harvested under EUTR (EU Timber Regulation). Nordic Swan Ecolabel's ban on the use of tree species listed in CITES (Appendix I, II or III) goes beyond the EU legislation. CITES regulates trade in endangered species, and there are also challenges with corruption in the trade in wild animals and plants[63]. Therefore, Nordic Ecolabelling does not want to approve species on any of the appendices.

IUCN Red Lists[64] are the world's most comprehensive inventory of the global conservation status of the planet's biological species, including trees. IUCN Red List has established clear criteria to assess the risk of extinction among thousands of species and subspecies according to the origin of the tree species. These criteria cover all countries and all species in the world. Nordic Swan

[63] Addressing corruption in CITES documentation processes Willow Outhwaite, Research and Analysis Senior Programme Officer, TRAFFIC, 2020: https://www.traffic.org/site/assets/files/12675/topic-brief-addressing-corruption-in-cites-documentation-processes.pdf
[64] http://www.iucnredlist.org/ (visited January 2020)

Ecolabelling is aware that the IUCN's red list system only focuses on the extinction risk of species, and therefore is not designed for an overall assessment of whether a tree species can be provided with sustainable origin. However, the list is continually being updated and thereby is an important tool to estimate a specific tree species' conservation status on a global scale. Nordic Swan Ecolabel wishes to prohibit tree species listed as endangered (categories CR, EN and VU).

Regnskogfondet[65] (Rainforest Foundation Norway) is an NGO in Norway that works to protect the world's remaining rainforests. Currently, Regnskogsfondet does not see any credible certification schemes working in the tropics, and therefore recommends full stop of buying tropical timber. Regnskogsfondet has developed a list of tropical tree species based on tree species found on the Norwegian market. This list works as a guide to comply with Norwegian guidelines regarding non-use of tropical wood in public construction. We consider this a pragmatic approach for handling tropical tree species on the Nordic market.

In addition, Siberian larch (originated in forests outside the EU) is on the tree list. Siberian larch is a coveted tree species in the construction industry due to its high quality. The tree species is widespread in the Eurasian northern boreal climate zone, and particularly the species Larix sibirica, Larix gmelinii, Larix cajanderi and Larix sukaczewii are widespread in the large areas of intact forest landscapes (IFL) in Russia. Siberian larch is to be seen as an indicator species for boreal IFL-areas which are important to keep intact.

Exemption from the tree list:

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

Many of the tree species on the list are grown in countries which still have large areas of IFLs. These are important to protect due to biodiversity and climate. Many 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. There are different views on whether certification is good enough to meet the challenges of forest management in land with a high risk of corruption and illegal logging. For instance, relevant challenges related to this have been published by Danwatch in several articles in 2018[66,67], and by redd-monitor.org in 2019[68]. Greenpeace International has ended its memberships in FSC on the grounds that the certification body is no longer meeting its aims of protecting forests and human rights[69]. Other environmental organisations like WWF support certification as an important tool

[65] https://www.regnskog.no/no/hva-du-kan-gjore/unnga-tropisk-tommer/tropiske-treslag (visited January 2020)
[66] https://danwatch.dk/undersoegelse/dokumentfalsk-og-millionboeder-danske-byggemarkeder-saelger-trae-forbundet-til-ulovlig-hugst-i-amazonas/
[67] https://danwatch.dk/undersoegelse/baeredygtighedsmaerke-er-ingen-garanti-for-baeredygtigt-trae/
[68] https://redd-monitor.org/2019/08/29/evicted-for-carbon-credits-new-oakland-institute-report-confirms-forced-evictions-for-green-resources-plantations-in-uganda/
[69] https://www.greenpeace.org/international/press-release/15589/greenpeace-international-to-not-renew-fsc-membership/

for sustainable forestry in these countries. However, due to the uncertainty whether FSC and PEFC certification systems are good enough in protecting important areas of biodiversity and ethical aspects like human rights and land ownership in areas with a high risk of corruption, Nordic Ecolabelling have a precautionary approach and wants further documentation about the tree species and its origin.

To document full traceability of the tree species, the applicant/manufacturer/supplier must 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. This means that Nordic Swan Ecolabelling does not accept the FSC percentage or credit control system as well as PEFC percentage system. Full traceability of the tree species back to the forest/certified forest unit, enables the applicant/manufacturer/supplier to document that the tree species does not come from an area/region where it is IUCN red listed, categorized as CR, EN or VU. Full traceability also makes it possible to document that the tree species does not come from Intact Forest Landscape (IFL), defined by Intactforest.org in 2002[70]. Intact forest has been monitoring IFL-areas since 2000 and has developed an online up to date mapping tool that shows the extent of IFL back to 2000. The monitoring results shows that the world's IFL are being degraded in an alarming speed, and that is the reason for Nordic Swan Ecolabelling referring to 2000.

Plantation: Nordic Swan Ecolabelling believe, that responsibly run forest plantations can play a role in preserving natural IFLs by reducing the pressure to harvest the world's remaining natural forests. To secure that plantation has not replaced native ecosystems (forest/grasslands) within the last 25 years, tree species must come from FSC or PEFC certified plantations that were established before 1994. 1994 is in line with FSCs international forest management standard (version 5.2), whereas PEFC is working with 2010.

The list of restricted tree species is located on http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements-2020/.

If the applicant does not use tree species listed on a)-d):

The requirement can be documented by a declaration from the applicant stating that tree species with restricted use in Nordic Ecolabelled product are met. Nordic Ecolabelling may demand more documentation for a specific tree species.

O14 Regenerated cellulose fibre: Traceability and certified raw materials

The requirement applies if regenerated cellulose fibres are included with more than 10% by weight in the textile part.

The manufacturer of regenerated fibre or the manufacturer of the dissolving pulp must state the name (species name) of the raw material 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.

[70] http://www.intactforests.org/world.webmap.html, visited January 2020

Manufacturers who only use recycled material are exempt from the requirement for Chain of Custody certification.

Certification of the fibre raw materials in regenerated fibres, on an annual basis:

1. At least 50% of the raw materials 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

   or

2. At least 70% of the fibre raw material must be recycled material*

   or

3. A combination of certified and recycled fibres, calculated using the following formula:

   Requirement for the percentage of fibre raw material from certified forestry in the pulp (Y):

   $Y (\%) \geq 50 - 0.67 x$

   where x = percentage of recycled material.

The remaining percentage of wood/bamboo raw materials must be covered by the FSC/PEFC compliance schemes (FSC Controlled Wood/PEFC Controlled Sources).

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.

Producers of dissolving pulp must be specified. If several pulps are mixed, the certification percentage must be met for the finished pulp that is used.

* *See definition in section 4.2.*

The manufacturer of regenerated fibres or the manufacturer of the dissolving pulp shall describe name (species name) on the fibre raw material used.

Valid Chain of custody certificate from manufacturer of pulp or regenerated cellulose or link to certificate holders' valid certificate information in FSC/PEFC databases covering all wood and bamboo fibre raw materials used (e.g., via link to the website).

Producers that only use recycled fibres from carboard and paper shall show that the recycled fibres are covered by EN 643 delivery notes. In the case of recycled fibres from other sources, the supplier must be stated, and it must be shown that the fibres are recycled according to the definition.

If the requirement for certification percentage is documented by the manufacturer of dissolving pulp (s) must be specified. The pulp producer must document that the pulp contains a minimum of 50% certified raw material on an annual basis by enclosing accounts which show the proportion of certified wood raw material in production, and that the rest of the raw material is from controlled sources.

If the requirement for certification percentage is documented by the manufacturer of regenerated cellulose, the supplier (s) of the dissolving pulp must enclose documentation for the proportion of certified fibre in the various pulps purchased and that the average certification percentage is met on an annual basis. Documentation must be attached, e.g., invoice or delivery note, for delivery between pulp producer and producer of regenerated cellulose which

shows that purchased pulp contains a minimum of 50% certified wood raw material or bamboo.

Alternatively, the claim can be documented by the next link (purchaser of the regenerated cellulose fibres) purchasing FSC/PEFC marked regenerated cellulose fibre or with a claim with 50% certification. Nordic Ecolabelling may request further documents to examine whether the requirements are fulfilled.

Background to requirement

The requirement concerns the use of raw materials, which must be legally harvested and not come from protected areas of land. The raw material for regenerated cellulose fibre is usually wood fibre or bamboo. Recycled cotton or viscose fibre may also be used. Bamboo is also required to be grown in forest areas that are certified according to one of the FSC or PEFC standards. More information about Nordic Ecolabelling's forestry requirements can be found on the Nordic website[71]. Nordic Ecolabelling also wants to stimulate the use of recycled fibre and sees that in Sweden renew cell is produced as a cellulose pulp of old cotton and viscose fibres, which can be used in new fibre production.

O15 Regenerated cellulose fibre: Bleaching with chlorine gas

Chlorine gas* must not be used when bleaching cellulose mass or cellulose fibres.

** Residual amounts of chlorine gas formed during the production of chlorine dioxide from chlorate are excluded.*

A declaration from the cellulose mass and regenerated cellulose manufacturers that the requirement is fulfilled or a valid EU Ecolabel licence in accordance with the Commission's decision from 2014.

Background to requirement

Chlorine gas is not used for bleaching cellulose pulp in Europe today, but it is still in use in some parts of the world. Chlorine gas and hypochlorite can still be used in the production of cellulose for regenerated cellulose fibres. Because there are good alternative bleaching methods for cellulose pulp today, the previous ban on bleaching with chlorine gas will be continued. When bleaching with chlorine dioxide, residues may arise as a by-product, and these are therefore exempt from the requirement. Hypochlorite is still used in the bleaching of regenerated cellulose fibres in Europe and is prohibited in this requirement.

O16 Regenerated cellulose fibre: Process

The requirement applies if regenerated cellulose fibres are included with more than 10% by weight in the textile part.

Fibre production must be based on "closed loop"* processes such as the lyocell process, direct spinning of cellulose (the Spinnova process) or similar closed processes.

** "Closed loop" is defined here as processes with a high degree of recycling of chemicals that are included (>99%) or processes without release of chemicals.*

Documentation showing that the production of the regenerated cellulose fibres is produced with "closed loop" processes in accordance with the requirement.

Background to requirement

The purpose of this requirement is to promote the more environmentally friendly manufacturing methods such as the lyocell process and the Spinnova process. The requirement only accepts "closed loop" processes. "Closed loop" processes i.e., processes with more than 98% recycling rate for chemicals used or processes without the use of chemicals. This limits emissions of harmful chemicals to air and water. Examples of such processes are the lyocell process (>99% recovery of biodegradable solvent) and the Spinnova process (mechanical spinning without chemicals). Other newly developed processes can be approved as "closed loop" after the assessment of Nordic Ecolabelling.

4.4.2 Textile chemicals: General requirements

The requirements in this chapter apply to all chemical products used in wet processes during the production of textiles (excluding fibre production), as well as chemical products used for finishing. Examples of chemicals include softeners, solvents, bleaching agents, pigments and dyes, stabilisers, dispersants, enzymes, and other auxiliary chemicals. Examples of processes covered by the requirements are washing, bleaching, and dyeing as well as finishing. Examples of finishing processes are printing, impregnating, or coating. The requirements apply regardless of whether it is the textile producer or their supplier that uses the chemicals.

Chemical products used in water treatment plants or for the maintenance of production equipment are exempted from the requirements.

O17 Overview of chemical products

All chemical products shall be stated and documented with a safety data sheet. A combined list or separate lists shall be drawn up for each production process and/or supplier, including finishing such as printing on textiles and products.

The following information shall be submitted for each chemical product:

- trade name
- the function of the chemical
- the process step in which the chemical product is used
- the supplier/producer using the chemical product

List of chemical products for every production process and/or supplier.

Safety data sheet for every chemical product, in line with Annex II of REACH 1907/2006.

Background to requirement

To gain an overview of which chemicals are used in the various processes in the textile production after fibre production, the criteria require the submission of a list of all the chemicals used.

O18 Classification of chemical products

Chemical products shall not be classified as any of the hazard categories set out in the table below.

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Toxic to aquatic life	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2	H400 H410 H411
Hazardous to the ozone layer	Ozone	H420
Carcinogenicity*	Carc 1A or 1B Carc 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 3	H300, H310, H330 H301, 311, 331
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 the classification H350i.*

Note that responsibility for correct classification lies with the manufacturer.

*** Non-disperse dyes are exempt from the prohibition of H334 and H317, provided that non-dusting formulations are used or that automatic dosing is used. If manual filling of automatic dosing systems is used, the manual handling must be carried out using the correct personal protective equipment in accordance with the safety data sheet (SDS) and/or using technical measures such as local extraction/ventilation.*

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

- For exempted non-disperse dyes: Declaration that non-dusting formulations of these are used or that automatic dosing is used. The dyehouse must send routines for the use of personal protective equipment when manually handling dusty colours or a description of technical measures.

Background to requirement

The requirement covers all chemicals used in wet processes during the production of textiles that form part of the mop, cloth, or pad (excluding fibre production), as well as chemicals for finishing, softeners, and solvents. It excludes disperse dyes and other chemicals that are classified as H334 (May cause allergy or asthma symptoms or breathing difficulties if inhaled) and H317 (May cause an allergic skin reaction). Since disperse dyes are not covalently bonded to the textile fibre, their colour fastness will often be lower. There is therefore assessed to be a greater risk of exposure to disperse dyes. Therefore, stricter requirements are set for disperse dyes that are classified as allergenic[72].

O19 Prohibition of CMR substances

Chemical products shall not contain any ingoing substances* that have any of the classifications in the table below.

** See definition in section 4.2.*

CLP Regulation 1272/2008		
Hazard class	**Hazard category**	**Hazard code**
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351**
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity*	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: Titanium dioxide (TiO2) which is added in powder form during raw material production.*

Declaration from the chemical product manufacturer/supplier, that the requirement is fulfilled.

Background to requirement

The requirement excludes all constituent CMR substances. Ingoing substances are defined as all substances, whatever their concentration, in a used chemical (e.g., pigment or bleaching agent) or blend of chemicals (e.g., printing paste, coating), including additives (e.g., preservatives and stabilisers). Known products released from ingoing substances (e.g., formaldehyde, arylamine and in-situ generated preservatives) are also considered to be constituent. Impurities are defined as residual substances from production, including raw material production, that are present in a chemical product in concentrations of ≤100 ppm (≤0.0100 weight%, ≤100 mg/kg).

The requirement excludes the use of all ingoing CMR substances in categories 1A, 1B and 2. Quinoline, classified as Carc. 1B and Muta. 2, was the substance that was found the most in textile samples analysed in the study conducted by KEMI entitled "mapping of dangerous chemical substances in textiles"[73]. The overall health risk assessment performed within the scope of this study showed that exposure to quinoline from textiles could pose an increased risk for adverse health effects. Quinoline is included among the 33 CMR substances restricted in textiles and footwear listed in Item 72 of Annex XVII to REACH. According to the restriction, the maximum permissible content of quinoline in textiles is 50 ppm. The substance can appear as a contaminant in dispersing agents used in the manufacture of disperse dyes and has also biocidal properties and so may also be used as a fungicide. Nordic Ecolabelling strives to ensure that the health and environmental impacts of the products are as low as possible. The definition for impurities from section 4.2 has been written in accordance with this principle and enable, for instance, the exclusion of the use of disperse dye containing quinoline in concentrations exceeding 100 ppm.

An exception has been made for titanium dioxide which is added in powder form during raw material production. On February 18, 2020, the European Commission published the decision that titanium dioxide will be classified as a suspected carcinogen (Category 2, H351) upon inhalation under the CLP

[73] https://www.kemi.se/download/18.6fe7831717837afaeb69e3/1616520365507/Rapport-4-21-Kartlaggning-av-farliga-kemiska-amnen-i-textil-sammansatt.pdf

Regulation. The classification is only applicable to mixtures in the form of powders containing at least 1% of titanium dioxide particles which are in the form of or incorporated into particles having an aerodynamic diameter of ≤10 µm. The classification provision has been debated, as the risk that gives rise to the hazard classification applies to inhalation of powder, and not the chemical substance itself. Liquid and certain solid mixtures of titanium dioxide are not classified. It can be difficult to find replacements in the short term, which is why Nordic Ecolabelling has made an exception for the use of titanium dioxide in powder form.

O20 Prohibited substances

The following substances shall not be an ingoing substance* in chemical products:

** See definition in section 4.2.*

- Substances on the Candidate List (https://echa.europa.eu/candidate-list-table). Siloxanes D4, D5 and D6 have their own documentation requirement, see requirement O23.
- Substances that are PBT (Persistent, Bio accumulative, and Toxic) or vPvB (very Persistent and very Bio accumulative) as set out in the criteria of REACH Annex XIII
- Potential or identified endocrine disruptors according to any of the EU member state initiative "Endocrine Disruptor Lists", List I, II and III***. See the following links:
  - https://edlists.org/the-ed-lists/list-i-substances-identified-asendocrine-disruptors-by-the-eu
  - https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
  - https://edlists.org/the-ed-lists/list-iii-substances-identified-asendocrine-disruptors-by-participating-national-authorities
- Flame retardants (e.g., short chain chlorinated paraffins)
- Per- and polyfluoroalkyl substances (PFASs), e.g., PFOA and PFOS
- Nanomaterials/-particles*
- Heavy metals**
- Metal complex dyes
- Azo dyes that may release carcinogenic aromatic amines (see Appendix 4)
- Phthalates
- Chlorinated solvents and carriers, including chlorotoluenes, chlorophenols and chlorobenzenes
- Alkylphenol ethoxylates (APEO) and other alkylphenol derivatives
- Organotin compounds
- Linear alkylbenzene sulphonates (LAS)
- Quaternary ammonium compounds such as DTDMAC, DSDMAC and DHTDMAC
- EDTA (ethylene diamine tetra acetic acid) and DTPA (diethylene triamine pentaacetate)

** The definition of nanomaterial follows the European Commission's definition of nanomaterial of 18 October 2011 (2011/696/EU). Pigments are exempted from the requirement.*

*** Heavy metals are the metals listed in point 1 below. Exemptions from the requirement are granted for:*

1) 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), chromium VI (10 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)

2) exception for iron used for colour depigmenting before printing.

**** 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.*

Declaration from the chemical product manufacturer/supplier that the requirement is fulfilled.

Background to requirement

The list of prohibited substances now covers the 11 substance groups that the textile industry widely agrees on phasing out. The list of the 11 substance groups derives from the "Detox My Fashion" initiative that Greenpeace launched in 2011[74]. Other initiatives such as Detox to Zero by Oeko-Tex and ZDHC[75] also refer to this list of substances. The previous generation of the criteria included some of these substance groups in separate requirements. The decision has now been taken to gather them all together here, with the prohibition list covering all chemicals used in the textile production.

Under this requirement, Nordic Swan Ecolabelled supplies for microfibre based cleaning are subject to a prohibition list that covers, with third-party audits, all 11 substance groups on Greenpeace's Detox List in the production of textiles. Nordic Ecolabelling defines "prohibition" as follows: The prohibition of specific ingoing substances encompasses all substances, whatever their concentration in a used chemical or chemical blend, including additives and known products released from ingoing substances. Impurities cannot, however, always be completely avoided. The only permitted impurities are residual products from production, including raw material production, that can be found in a used chemical in concentrations below 100 ppm. Such impurities may be reagents such as monomers, catalysts, by-products, or carry-over from previous production lines. See the precise definition of ingoing substances and impurities in section 4.2.

Some of the substance groups and substances in the requirement may already have their use restricted in the EU. The Annex XVII to REACH contains several restrictions covering chemical substances or groups of substances in textile

[74] Destination Zero: Seven Years of Detoxing the Clothing Industry, https://storage.googleapis.com/planet4-international-stateless/2018/07/destination_zero_report_july_2018.pdf
[75] ZDHC Manufacturing Restricted Substances List (ZDHC MRSL), https://www.roadmaptozero.com/mrsl_online/

products. The restrictions regulate the presence of chemical substances in textiles, as well as in details of other material that may be present in textile products. Several flame retardants, azo dyes, phthalates, polybrominated biphenyls, nonylphenol ethoxylates, PAH, as well as 33 CMR-substances are some examples[76]. See Annex XVII to REACH for more information about the regulated area of use and the limit values[76]. The Nordic Ecolabel follows the precautionary principle and decides to exclude whole group of substances such as phthalates, PFAS and flame retardants. Furthermore, many supplies for microfibre based cleaning are produced outside the EU. It is therefore relevant to require documentation confirming their absence.

Candidate List and Substances of Very High Concern (SVHC):

The Candidate List identifies substances of very high concern (SVHC) which fulfil the criteria in article 57 of the REACH Regulation (EC 1907/2006). The list includes carcinogenic; mutagenic; and reprotoxic substances (CMR, categories 1A and 1B in accordance with the CLP Regulation); and PBT (persistent, bio accumulative and toxic) and vPvB (very persistent and very bio accumulative) substances (as defined in REACH Annex XIII). In addition, two more substance groups are included if they are of equivalent level of concern (ELoC) as the ones previously mentioned. These are endocrine disruptors and substances which are environmentally hazardous without fulfilling the requirements for PBT or vPvB. Based on these adverse characteristics, Nordic Ecolabelling prohibits substances on the Candidate List. This means that we act ahead of the legislation and ban the substances before they are subject to authorisation and restriction in accordance with REACH.

PBT and vPvB:

PBT (Persistent, Bio accumulative and Toxic) and vPvB (very Persistent and very Bio accumulative) are organic compounds defined in Annex XIII of REACH (Regulation (EC) No 1907/2006). Nordic Ecolabelling generally does not want such substances to be included in the products.

Potential endocrine disruptors:

Potential endocrine disruptors are substances that may affect hormonal-based processes in humans and animals. Hormones regulate several vital processes in the body and are particularly important for development and growth in humans, animals and plants. Several studies conducted on animals show that changes in hormones concentrations can have undesirable effects such as abnormal genital organ development and decreased fertility. Emissions to the aquatic environment are one of the greatest sources for the spread of endocrine disruptors[77]. Nordic Ecolabelling excludes identified and potential endocrine disruptors listed on the "Endocrine Disruptor Lists" at www.edlists.org, which is based on an initiative taken by several EU member states. A substance listed in List I, II and/or III is excluded. Licensees are responsible for keeping track of updates of the lists, so that their ecolabelled products meet the requirement through the validity of the licence. Nordic Ecolabelling acknowledges the challenges associated with new

[76] https://echa.europa.eu/sv/substances-restricted-under-reach
[77] Miljøstatus i Norge (2008): Hormonforstyrrende Stoffer. http://www.miljostatus.no/Tema/Kjemikalier/Noen-farlige-kjemikalier/Hormonforstyrrende-stoffer/#D (dated 26.02.2009)

substances that are introduced in List II and III. We will evaluate the circumstances and possibly decide on a transition period from case to case.

The requirement concerns the main lists (List I-III) and not the corresponding sub lists called "Substances no longer on list". A substance which is transferred to a sub list 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 e.g., the Cosmetics Regulation, which doesn't have provisions for identifying EDs. 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 sub list II case-by-case, based on the background information indicated on the sub list.

By excluding both identified and prioritised potential EDs which are under evaluation, Nordic Ecolabelling ensures a restrictive policy on endocrine disruptors.

Flame retardants:

Flame retardants come in several different types. For example, brominated flame retardants, chlorinated or phosphorous flame retardants. Flame retardants are suspected of contributing to several unwanted health effects. Several of the substances are suspected of causing birth defects, cancer, and endocrine disrupting effects. The flame retardants HBCDD, short chain chloro-paraffins, TCEP, boric acid (and certain salts thereof), boron oxide and certain borax compounds (sodium tetraborate decahydrate and sodium tetraborate pentahydrate) are on the EU candidate list under REACH.

Many brominated flame retardants (BFR) are persistent and bio accumulative chemicals that can now be found dispersed in nature. Polybrominated diphenyl ethers (PBDE) are one of the most common groups of BFR and they have been used as flame retardants on a wide range of materials, including textiles. There are, for instance, examples of hexabromocyclododecane (HBCDD) and tetrabromobisphenol A (TBBPA) being used on fabrics for cars. Other relevant textiles that may have been treated with flame retardants include bed linen in the healthcare sector (hospitals, care homes and nursing homes) and workwear[78]. The focus on phasing out brominated flame retardants has led to the use of alternatives such as phosphorus and nitrogen-based flame retardants.

Per- and polyfluoroalkyl substances (PFAs), e.g., PFOA and PFOS:

Fluor surfactants and other per- and polyfluoroalkyl substances (PFASs) constitute a group of substances that have harmful properties. Certain per- and polyfluorinated compounds can degrade to the very stable PFOS (perfluoro octane sulphonate) and PFOA (perfluorooctanoic acid) and similar substances.

[78] Survey, health, and environmental assessment of flame retardants in textiles, Danish Environmental Protection Agency, 2014

These substances are extremely persistent and are easily absorbed by the body[79]. The substances have been found all over the globe and more specifically in birds, in fish and their eggs. The substances in this group impact on the biological processes of the body and are suspected to be endocrine disruptors, carcinogenic and to have a negative impact on the human immune system[80]. PFOA, APFO (ammonium pentadecane fluoro octanoate) and certain fluoride acids are on the Candidate List due to, for instance, their negative effect on fertility and being PBT. There are new research results showing that shorter chains (2-6 carbon atoms) have been discovered in nature[81].

Chlorinated compounds such as PVC:

PVC (polyvinylchloride) may contain hazardous phthalates and since they are not chemically bonded to the plastic, they can leak out of the products[82]. In addition, soft PVC coating on the textile is not desirable in the waste stage, where it can be problematic either in incineration facilities or when the textile fibre is recycled.

Nanoparticles:

Nanomaterials are a diverse group of materials under the size of 100 nm, which are often more reactive and can have altered properties compared to their bulk counterparts. Further, different sizes, shapes, surface modifications and coatings can also change their physical and chemical properties, which complicates the risk assessment. There is concern among regulators, scientists, environmental organisations, and others about the insufficient scientific knowledge regarding the potential detrimental effects on health and the environment. Nanomaterials can cause increased or unwanted effects in humans or the environment since nano particles can cross biological membranes and thus be taken up by cells and organs. One of the main concerns are linked to free nanoparticles, as some of these – when inhaled – can reach deep into the lungs, where the uptake into the blood is more likely. Inhalation studies in rats have shown that nanoparticles may induce more irreversible inflammation and result in more tumours than an equal mass of larger particles. Therefore, nanomaterials are restricted.

Heavy metals:

The requirement prohibits the use of the following heavy metals: antimony, arsenic, cadmium, chromium, lead, mercury, zinc, copper, nickel, tin, barium, cobalt, iron, manganese, selenium, and silver.

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[79] Borg, D., Tissue Distribution Studies And Risk Assessment Of Perfluoroalkylated And Polyfluoroalkylated Substances (PFASS), Doctoral Thesis, Institute Of Environmental Medicine (IMM) Karolinska Institute, Stockholm, Sweden 2013
http://publications.ki.se/xmlui/bitstream/handle/10616/41507/Thesis_Daniel_Borg.pdf?sequence=1

[80] E.g., Heilmann, C. et al, Persistente fluorbindelser reducerer immunfunktionen, Ugeskr Læger 177/7, 30.3.2015 OSPAR 2005: Hazardous Substances Series, Perfluorooctane Sulphonate (PFOS), OSPAR Commission, 2005 (2006 Update), MST, 2005b: Miljøprojekt nr. 1013, 2005, More Environmentally Friendly Alternatives to PFOS-compounds and PFOA, Danish Environmental Protection Agency, 2005.

[81] Perkola, Noora, Fate of artificial sweeteners and perfluoroalkyl acids in aquatic environment, Doctoral dissertation Department of Environmental Sciences, Faculty of Biological and Environmental Sciences, University of Helsinki, Finland 12.12.2014,
https://helda.helsinki.fi/bitstream/handle/10138/136494/fateofar.pdf?sequence=1

[82] Miljøstatus i Norge: http://www.miljostatus.no/no/Tema/Kjemikalier/Noen-farlige- kjemikalier/Ftalater/ (accessed 04.12. 2011).

Heavy metals such as cadmium, lead and mercury may be found as impurities in certain dyes and pigments used for textiles. These metals can accumulate in the body over time and are highly toxic with irreversible effects, including damage to the nervous system (lead and mercury) or kidneys (cadmium). Cadmium is also known to cause cancer. Cadmium is classified as carcinogenic, mutagenic, reprotoxic, toxic and toxic for aquatic organisms. Chromium is allergenic, carcinogenic, and toxic for aquatic organisms. The use of cadmium, mercury and lead has become very limited in textiles, but controlling for them remains relevant[83].

Metal complex dyes:

Metal complex dyes are used in connection with the dyeing of wool, silk, cotton, and polyamide, for example. Metal complex dyes are problematic because they contain undesirable heavy metals. The requirement prohibits the use of metal complex dyes and pigments containing, for example, chromium, cobalt, and nickel.

Parts of the industry state that it is possible to phase out metal complex dyes even for the dark colours and still produce textiles of good quality that the market wants. Other businesses believe that the restrictions being introduced make it more difficult for them to produce all the types of goods that the market demands. It is, however, worth considering whether customers would demand these colours, if they knew that there were less environmentally harmful alternatives

Azo dyes:

Aromatic amines released by azo dyes may be carcinogenic, allergenic, irritating, and toxic.

In relation to the previous version of the criteria, the requirement has been extended to include 12 substances described in the report "Toxics in Carpets in the European Union". These 12 aromatic amines have been identified as degradation products from azo dyes used in carpets and are also considered to be relevant for textiles. All the carcinogenic aromatic amines covered by the Nordic Ecolabel requirement are listed in Appendix 4. The 12 new substances in this criteria version are listed at the bottom.

Some of the substances in Appendix 4 are excluded through REACH (Regulation No. 1907/2006) Annex XVII No 43 if they are included in quantities exceeding 30 mg/kg.

Note that Nordic Ecolabelling's requirements go further than REACH, by entirely prohibiting the use of azo dyes that may release any of the carcinogenic aromatic amines.

Phthalates:

Several phthalates* are identified as endocrine disruptors and some of them are classified as reprotoxic. For these reasons several phthalates are included in the

[83] Investigation of chemical substances in consumer products, Danish Environmental Protection Agency 2011.

Candidate list. Based on their hazardous properties, phthalates pose a threat to the environment and human health and there is a ban on this group of substances. When the phthalates are used as plasticisers in plastic products, they are not bound to the material, and will slowly be released during the use of the product[84]. In the textile industry, they are used in the print on textiles, waterproof fabrics, artificial leather, rubber, as a plasticiser in PVC, and in some dyes.

Chlorinated solvents, including chlorophenols and chlorobenzenes:

Chlorinated solvents – such as trichloroethane (TCE) – are used by textile producers to dissolve other substances during manufacture and to clean textiles. TCE is an ozone depleting substance that is persistent in the environment. It is also known to affect the central nervous system, liver, and kidneys. Since 2008, the EU has severely restricted the use of TCE. Chlorinated carriers may be used for the colouring of synthetic fibre and fabric or blends of polyester and wool.

Chlorobenzenes are persistent and bio accumulative chemicals that have been used as solvents and biocides in the production of dyes and as auxiliary chemicals. The effect of exposure depends on the type of chlorobenzene; however, they tend to affect the liver, thyroid, and central nervous system. Hexachlorobenzene (HCB) is the most toxic and persistent chemical in this group, as well as being an endocrine disruptor.

Chlorophenols:

Chlorophenols are a group of substances that are often used as biocides in a wide range of products. Pentachlorophenol (PCP) and its derivatives are, for example, used as biocides in the textile industry. PCP is highly toxic to humans and can affect the body's organs. It is also highly toxic for aquatic organisms. The EU prohibited the manufacture of products that contained PCP in 1991 and now also severely restricts the sale and use of all goods that contain the chemical.

Imported products containing PCP are the most significant remaining sources of potential PCP emissions and exposure. It may, for example, be present in leather and textiles to protect against mould. Chlorophenols may also be present as impurities from the raw materials used in the production of dyes. Furthermore, PCP and tetra chlorophenol (TeCP) may be used as preservatives in printing paste for textiles[85].

Alkylphenols ethoxylates and other alkylphenol derivatives:

The non-ionic APEO group of surfactants are produced in large volumes and their uses lead to widespread release to the aquatic environment. APEOs are highly toxic to aquatic organisms and degrade to more environmentally persistent compounds (alkylphenols). Ethoxylated nonylphenol and several other alkylphenols are included in the Candidate List due to endocrine disrupting properties. The textile industry uses NPs in its washing and dyeing processes.

[84] Guidance to businesses on phthalates, Danish Environmental Protection Agency 2013.
[85] Roadmap to zero https://www.roadmaptozero.com/fileadmin/layout/media/downloads/en/Chlorophenols.pdf accessed 02.08.2019.

Organotin compounds:

Organotin compounds are used in biocides and as fungicides in a wide range of consumer products. In the textile industry, they can be found in products such as socks, shoes, and sportswear to prevent odours caused by the breakdown of perspiration. One of the most common organotin compounds is tributyltin (TBT). Several of the tin-organic compounds are banned for selected areas of use through Reach Annex XVII entry 20 and the following three; TBTO, DBTC and DOTE are on the EU Candidate List[86].

Linear alkylbenzene sulphonates (LAS):

LAS is an active ingredient in detergents and cleaning agents that may be used in washing processes during textile production. LAS is, as a surfactant, highly toxic and can be lethal to aquatic organisms such as fish, crustaceans, and algae. The toxic effect is due to surfactants dissolving fat and proteins and thus also the living organism's cells and their cell membranes. In addition, LAS is not degraded anaerobically and will thus end up in the sludge in treatment plants where the substance is potentially harmful due to its toxicity to aquatic organisms. Therefore, LAS is excluded.

Quaternary ammonium compounds such as DTDMAC, DSDMAC and DHTDMAC:

The cationic detergents distearyl dimethyl ammonium chloride (DSDMAC), dehydrogenated tallow alkyl dimethyl ammonium chloride (DTDMAC) and dehydrogenated tallow dimethyl ammonium chloride (DHTDMAC) are substances with toxic and persistent properties.

Their emissions to water have been significantly reduced in recent times. Concern remains, however, over their use in softeners, through which they can reach surface water via direct discharges, sewerage systems or wastewater treatment plants. These three surfactants have been phased out in many countries, in line with the PARCOM Recommendation 93/4 on the Phasing Out of Cationic Detergents DTDMAC, DSDMAC and DHTDMAC in Fabric Softeners. Since they might possibly still be used in some countries, their exclusion remains relevant[87].

EDTA and DTPA:

EDTA (ethylenediaminetetraacetic acid) and its salts are not readily degradable and the EU's risk assessment states that under the conditions at municipal water treatment plants EDTA is either not broken down or only breaks down to a slight degree (CEFIC, 2009). Today there are more environmentally aware alternatives that are degradable and able to replace EDTA in chemical products. These include MGDA (methylglycinediacetic acid). EU is also actively working to limit EDTA in the paper industry (Official Journal of the European Union, 2006/C 90/04). EDTA is used as a complexing agent in the production of many chemical products for technical use. Pentetic acid or

[86] https://miljostatus.miljodirektoratet.no/tema/miljogifter/prioriterte-miljogifter/tbt-og-andre-organiske-tinnforbindelser/.
[87] JRC Technical Reports: Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Textile Products 2013.

diethylenetriaminepentaacetic acid (DTPA) is an aminopolycarboxylic acid consisting of a diethylenetriamine backbone with five carboxymethyl groups. The molecule can be viewed as an expanded version of EDTA and is used similarly. Consequently, the use of DTPA is also excluded.

4.4.3 Textile chemicals: Specific requirements

These requirements concern groups of chemical products used under specific wet processes. For instance, detergents used for cleaning processes.

The chemical products must also fulfil requirements in chapter 4.4.2.

O21 Degradability of detergents, softeners, and complexing agents

Chemical products that are used as detergents, softeners and complexing agents shall be either readily aerobically biodegradable or inherently aerobically biodegradable, in accordance with test methods OECD 301 A-F, OECD 310, OECD 302 A-C or equivalent test methods.

Softeners and complexing agents referred to as “chelating agents” and “sequestering agents” are also covered by the requirement.

The chemical product manufacturer/supplier must submit safety data sheets, in line with Annex II of REACH 1907/2006, or test reports showing fulfilment of the requirement.

Background to requirement

Detergents, softeners, and complexing agents are used in large quantities in the wet processes of textile production. It is therefore relevant to set a requirement that these chemicals must be readily degradable or inherently degradable, to reduce the environmental impact of these chemicals. Chelating agents and sequestering agents are synonymous with complexing agents and are therefore also covered by the requirement.

O22 Bleaching agents

Chlorinated substances shall not be used as bleaching agents. The requirement applies to bleaching of the textile.

Declaration from the dyehouse that the requirement is fulfilled.

Background to requirement

Chlorinated bleaching agents are environmentally hazardous and are therefore not permitted. The use of chlorinated bleaching agents has been reduced in the industry and alternatives are available, such as hydrogen peroxide (H_2O_2)[88]. Requirement O15 sets out provisions concerning bleaching agents for regenerated cellulose fibre.

O23 Chemicals containing silicone

D4 (CAS no. 556-67-2), D5 (CAS no. 541-02-6) and D6 (CAS no. 540-97-6) shall only be present in the form of residues from the raw material production, and each shall only be present in amounts up to 1000 ppm in the silicone raw material (the chemical).

[88] The EU Ecolabel’s background document, 2007.

Test from the chemical product manufacturer/supplier showing that the requirement is met. The analysis laboratory must fulfil the requirements in Appendix 2.

Background to requirement

Siloxanes D4, D5 and D6 are included on the Candidate List of Substances of Very High Concern in REACH, and so these substances are prohibited through requirement O20. However, a specific requirement has been included for these siloxanes to make it clear that documentation is required to confirm that the content is below the stated limit value in any silicone used. This is considered relevant because much of the textile production takes place in countries that are not covered by REACH.

It is possible to find chemicals containing silicone in use throughout the production chain, for example as softeners.

4.4.4 Textile chemicals: Additional requirements on finishing processes

These requirements concern all chemicals used in finishing processes, meaning the processes after bleaching/dyeing of the fabric, such as printing, impregnating, or coating, as well as any other application of chemicals that change the property of the fabric (smoothness, drape, lustre, water repellence, flame retardancy or crease resistance etc.).

The chemicals must also fulfil requirements in chapter 4.4.2.

O24 Biocides and antibacterial substances

The following substances, which may have a biocidal and/or antibacterial effect in the textile, are not permitted:

- Antibacterial substances (incl. silver ions, nano silver, and nano copper), and/or
- Biocides in the form of pure active ingredients or as biocidal products.

Naturally occurring antibacterial effects in materials are not subject to the prohibition.

Declaration from the chemical product manufacturer/supplier that the requirement has been fulfilled.

Background to requirement

Biocidal products and antibacterial products are not desirable in Nordic Swan Ecolabelled products, and the requirement excludes both chemical and physical treatments. Frequent use of antibacterial substances in ordinary consumer products may contribute to increased resistance in bacteria and the eradication of necessary bacteria, and Nordic Ecolabelling does not wish to contribute to this. Tests carried out by Swedish water company Svensk Vatten on sportswear treated with nano silver show that, after 10 machine washes, 31-90% of the nano silver had been washed out of the textile. Nano silver is harmful for the aquatic environment[89]. These substances are increasingly being added to consumer products – everything from textiles to kitchen equipment. Particular attention is

[89] Silverläckan, En rapport om silver i sportkläder 2018, Svenskt Vatten
file:///C:/Users/hbb/Downloads/Silverrapport%20Svenskt%20Vatten%2020181022C.pdf

being paid to nanometals such as nano silver and nano copper since they occur in many products.

These nanomaterials are added to achieve an antibacterial effect. There has been particular concern that emissions of nano silver into wastewater and other dispersal could eliminate desirable bacteria and cause resistance in bacteria. Another example of antibacterial substances that must not be used are organotin compounds and chlorophenols, which are used, for example, during the transport and storage of textiles.

For communication purposes, requirement O20 also specifies that organotin compounds are not permitted, since they are one of the 11 substance groups highlighted by Greenpeace in its "Detox My Fashion" campaign from 2011.

Naturally occurring antibacterial effects in materials (for example bamboo) are not subject to the prohibition.

O25 Polymers and their additives in finishes

Halogenated polymers are prohibited (e.g., PVC (polyvinylchloride) in finishes such as impregnation and coatings.

Additives* in polymers (e.g., added in master batch) used in finishes such as impregnation and coatings must meet the following requirements:

- O18 Classification of chemical products,
- O19 Classification of ingoing substances,
- O20 Prohibited substances

* *See definition in section 4.2.*

Declaration from the chemical product manufacturer/supplier that halogenated polymers are not used.

Declaration from the chemical/additive manufacturer or supplier, as described in requirement O18, O19 and O20.

Background to requirement

The general requirements from chapter 4.4.2 cover all chemical products used in wet processes during the production of textiles that form part of the mop, cloth, or pad (excluding fibre production), as well as chemicals used for finishes. Requirement O25 adds additive in polymers (e.g., added in master batch) used in finishes to the list of chemicals that must fulfil requirements O18, O19 and O20.

Coatings with or based on per- and polyfluorinated compounds, for example, are not permitted. These substances are excluded from use in requirement O20 Prohibited substances.

Fluorinated polymers are widely used as coatings or impregnating agents to obtain a product with breathable properties, while also being water resistant.

Fluorinated polymers such as perfluoroalkyl substances are highly persistent (stable) and non-degradable. The compounds are not soluble in water and fat and accumulates particles or tissue. They are bound to proteins and can be found with a high content in top predators. In a Nordic screening survey, PFAS compounds were found in all the sample types investigated, and the highest level was found in marine mammals. The report concluded that PFAS are found in

significant concentrations in the Nordic environment. The greatest focus is on the PFAS compound perfluoro octane sulphonate (PFOS), which is toxic for aquatic organisms, birds, and bees[90].

The greatest emissions of organic fluorinated substances occur during production of the clothing, but the substances are also dispersed into nature through use, washing and finally disposal of the clothing. The 2015 report "Alternatives to perfluoroalkyl and polyfluoroalkyl substances (PFAS) in textiles" from the Danish Environmental Protection Agency names paraffin oils and wax, silicone, polyurethane, and dendrimer-based substances as non-fluorinated alternatives for the treatment of textiles.

4.4.5 Textile production

O26 Wastewater from wet processes

Discharges of COD (chemical oxygen demand) in wastewater from wet processes which is discharged to surface water after treatment shall not exceed 150 mg/L. Wastewater that is sent to municipal or other regional treatment plants is exempted.

Test method: COD content shall be tested in accordance with ISO 6060 or equivalent.

The pH value of the wastewater released to the surface water shall be between 6 and 9 (unless the pH value in the recipient lies outside this interval).

The temperature of the wastewater released to the surface water shall be lower than 40°C (unless the temperature in the recipient is higher).

A test report shall 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.

Report submitted with application, showing average monthly calculations of COD, pH, and temperature for at least three of the past 12 months. (For COD, measurement of PCOD, TOC or BOD may be used if a correlation to COD is evident).

Description of how the wastewater from the wet process is treated and if the wastewater is sent to municipal or other regional treatment.

A written procedure showing how an annual test is performed in line with the requirement, along with in-house checks of compliance with the requirement.

Background to requirement

COD must be measured in relation to water consumption and not in relation to the amount of textile produced. The requirement level for COD is set on the basis of the various government requirements in Asia, which are between 150 and 250 mg/L. Blaue Engel (version 1.4, 2017) has a corresponding limit of 160 mg/L, while ZDHC Guidelines (version 1.1, July 2019) have 150 mg/L as the "Foundational limit".

[90] Norwegian Pollution Control Authority (2005) Monitoring of air and precipitation transported over long distances.

Measurement of PCOD, TOC or BOD can also be used if a correlation to COD is shown. Alternative test methods for ISO 6060 are, for example, GB/T 11914 (China), US EPA 410.4 and APHA 5220D.

High levels of COD in the wastewater can lead to oxygen depletion of the aquatic environment and thereby harmful effects on flora and fauna.

There is also a requirement that the temperature of the wastewater shall be lower than 40°C (unless the recipient's temperature is higher) and that the pH shall be between 6 and 9 (unless the recipient's value lies outside this interval).

It has been specified that the calculations must have been completed in at least 3 of the last 12 months, and a requirement has been set for a routine for annual self-inspection of the requirement.

O27 Implementation of Best Available Techniques (BAT) for energy efficiency and water savings

The applicant shall demonstrate that the energy used for e.g., washing, drying, bleaching, and curing associated with dyeing, printing, and finishing of the textile is measured and compared with BAT levels or own figures from before implementing efficiency techniques.

This shall be done as a part of an energy management system or a system for the management of CO_2 emissions. The requirement may be documented per process.

The applicant shall demonstrate that the water consumption associated with wet processes such as dyeing, printing, and finishing of the textile is measured.

There shall also be documentation for that the production facilities have implemented a minimum of BAT water and energy efficiency techniques or measures for in-house production of solar energy, see the table and the extra information about BAT themes below. This applies to the total production volume for the individual production facility.

BAT themes	Production volume	
	<10 tonnes per day	>10 tonnes per day
1. General energy management	Two techniques	Three techniques
2. Washing and rinsing	One technique	Two techniques
3. Drying and curing using stretchers	One technique	Two techniques

BAT themes
General techniques • Measuring how much is consumed and where • Process monitoring and automatic control systems for flow control, filling volumes, temperatures, and timings • Insulating pipes, valves, and flanges • Frequency-controlled electric motors and pumps • Closed design of machines to reduce evaporation losses • Reuse of water and liquids in batch processes • Combining multiple wet treatments into one process

• Heat recovery, e.g., from washing, steam condensate, exhaust air from processes, exhaust gases from combustion • Solar thermal panels, solar photovoltaic panels, or a heat recovery system for used hot water, installed within the operation, and generating energy amounting to 30% of what the process requires
Washing and rinsing • Using cooling water as process water • Replacing overflow tanks with drainage/inlet tanks • Using "intelligent" rinsing technologies with water flow control and counter flow • Installing a heat exchanger
Drying and curing using stretchers • Optimising air circulation • Insulating the premises • Installing effective burner systems • Installing heat recovery systems

The applicant must compile and submit reports from energy management systems for the individual dyeing, printing, and finishing facilities. ISO 50001 or equivalent systems for energy management or management of CO_2 emissions are accepted as documentation of the energy management system.

The applicant must compile and submit measurements of water consumption for the individual dyeing, printing, and finishing facilities.

The applicant must submit an overview of the dyeing, printing, and finishing facilities, stating the production volume per day for each process.

For each implementation of a BAT technique or process using solar energy produced in-house, the applicant must submit images of the facility, technical descriptions of the individual technologies and assessments of the energy savings achieved, along with a statement of the process and operation in which the technology has been implemented.

Background to requirement

The requirement is set to reduce energy and water consumption by implementation of a minimum of Best Available Techniques (BAT). It is assessed not possible to set an absolute requirement limit for energy and water consumption at this stage, since the knowledge of the consumptions is not well known. There is a requirement, instead, that the individual production facility must implement a minimum of BAT techniques for water and energy efficiency. BAT techniques are taken from the Reference Document on Best Available Techniques for the Textiles Industry, European Commission July 2003[91] and compared with the requirements for BAT techniques in the EU Ecolabel criteria for textile products from 2014.

[91] Reference Document on Best Available Techniques for the Textiles Industry, European Commission July 2003.

4.5 Cleaning tools

This section covers requirements for cleaning tools, such as mop handles, stands and other fixtures.

Cleaning tools cannot be ecolabelled separately. However, if cleaning tools are used and sold together with the microfibre product in the same packaging, they can be part of the ecolabelling and must fulfil requirements in section 4.5.

It must be possible to remove the cleaning fabric from the cleaning tool.

4.5.1 Materials used in cleaning tools

A material type that are present with a total amount of maximum 5% by weight of the cleaning tool are exempt from the requirements in chapter 4.5.1.

Material types that are not subject to any requirements in chapter 4.5.1 may account for no more than a total of 5% by weight of the cleaning tool.

If a material type account for more than a total of 5% by weight of the cleaning tool and are not subject to any requirements in chapter 4.5.1, Nordic ecolabelling can be contacted for assessment of whether the material and requirements for it shall be included in the criteria.

O28 Material recovery

It must be possible to separate different types of materials (incl. different types of plastic) from each other for recycling (not applicable to surface treatments). This must not require the use of special tools.

It must be possible to remove the cleaning fabric from the cleaning tool.

Specification by the applicant of how materials can be separated from each other and description of how it is possible to remove the cleaning fabric from the cleaning tool.

Background to requirement

To contribute to a circular economy, the Nordic Swan Ecolabelled products must be recyclable and/or their materials recoverable as far as possible. It is important to lay the foundation for recycling or material recovery right from the design phase. The different materials in the product must be separable from each other, so that the materials can be recycled at end-of-life.

O29 Aluminium: Recycled content

The requirement applies if aluminium is included with more than 30% by weight in the cleaning tool.

A minimum of 50% by weight of aluminium must be recycled*.

The supply chain must be specified, and there must be traceability through the supply chain from the smelter to the finished product, so that the amount of recycled aluminium is secured through the supply chain.

* *See definition in section 4.2.*

The proportion of recycled aluminium in the product must be stated.

The producer of aluminium must declare the amount of recycled aluminium in the production. Annual average for production is approved. The traceability of

the supply chain must be documented, e.g., in the form of a flow chart, so that the amount of recycled aluminium is secured through the supply chain. This can be done e.g., by information on invoices or accounts from the supplier of Al which shows the amount of recycled that is purchased and how much is sold. The requirement can be documented with a valid Hydro Circal certificate.

Background to requirement

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[92]. 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 has also a value, 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. 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. The industry average for EU-produced Al is approx. 50% recycled, while for Al outside the EU it is approx. 40%.

O30 Plastic: Information on polymer type and surface treatment

For each plastic part please state:

- Polymer type.
- Whether the polymer is fossil or biobased.
- Whether the plastic raw material is recycled*.
- Whether the plastic part has a surface treatment.

** See the definition in section 4.2.*

An overview of the polymer materials used, including the information set out in the requirement.

Background to requirement

The requirement has been set to gain an overview of the polymer types used in the cleaning tool, and whether these have been given a surface treatment. It is important to be able to judge which requirements in the criteria need to be documented for the product in question.

O31 Plastic: Polymer types and plastic composites – Ban

The following polymer/plastic types and blends must not be present in the cleaning tool:

- Chlorinated plastic, e.g., polyvinyl chloride (PVC) and polyvinyl dichloride (PVDC).
- Biodegradable plastic.
- Oxo-degradable plastic.
- Plastic composites*. Calcium carbonate (CaCO3) is allowed in plastic in quantities so that the density of the plastic does not exceed 0.995 g/cm^3.

[92] Taxonomy report, technical annex, EU technical expert group on sustainable finance, March 2020.

** Plastic composites are here defined as plastic mixed with/added to other substances or materials that are insoluble in the plastic and that disturb/"contaminate" today's Nordic plastic recycling systems, e.g., wood fibres or bamboo.*

Declaration from the cleaning tool manufacturer that the requirement is fulfilled.

Background to requirement

The requirement is designed to ensure that PVC (polyvinyl chloride) and PVDC (polyvinyl dichloride) are not included in the product, and to give an overview of the types of plastic included and whether they have been given a surface treatment. PVC can be used as soft or hard PVC. PVDC is a type of PVC with double chlorine atoms. In addition to the health risk of phthalates in soft PVC, the waste treatment of PVC is particularly problematic.

Oxo-degradable plastic is conventional plastic (e.g., PE) containing additives (e.g., metal salts) that cause the plastic to begin degrading[93]. Oxo-degradable and biodegradable plastics must not be used, since they "contaminate and disturb" the other recycled plastic streams in the Nordic region. Biodegradable plastic should not be confused with plastic based on biopolymers, which are dealt with in requirement O35.

Nordic Ecolabelling here defines plastic composites as plastic mixed with/added to other substances or materials[94], which are insoluble in the plastic[95] and which disrupt/"contaminate" today's Nordic plastic recycling systems. The purpose of the requirement is to avoid plastic composites which interfere with the plastic recycling processes used in the Nordic countries and which reduce the quality of the recycled plastic.

Plastic composites can cause problems with identifying the type of plastic correctly when the NIR technology is used. With low fractions of other materials than plastic, the NIR technology can probably sort the plastic types correctly, but the plastic composites will continue to have a negative effect on the overall quality of the recycled plastic[96,97]. With this in mind, plastic composites are not permitted, even if the fractions of other materials are as low as 0.5%.

Calcium carbonate ($CaCO_3$, chalk) is allowed as it does not significantly reduce the quality of the recycled plastic. However, if the plastic is added calcium carbonate in quantities so that it does not float in water, then this plastic waste will sink in the sink-float separation plant, where waste plastic is sorted, and this plastic will therefore not be recycled[98]. Therefore, calcium carbonate should only be added in quantities so that the density of the plastic does not exceed 0.995 g/cm^3.

[93] EU Plastics Strategy: https://ec.europa.eu/denmark/news/eu-strategi-plastic_da
[94] Plastindustrien: Komposit-plast | plast.dk
[95] Store Norske Leksikon: plastkompositter – Store norske leksikon (snl.no)
[96] https://plast.dk/wp-content/uploads/2019/12/Designguide-Genbrug-og-genanvendelse-af-plastemballager-til-de-private-forbrugere-online-version.pdf
[97] Dialog med to nordiske plastrecirkuleringsanlæg, 2020.
[98] The Association of Plastics Recyclers | HDPE Design Guidance (plasticsrecycling.org)

O32 Plastic: Marking for recycling sorting

Plastic parts heavier than 50 g must be clearly marked in compliance with the ISO 11469 and ISO 1043 standards.

Photo of plastic parts heavier than 50 g that demonstrate compliance with the requirement.

Background to requirement

Marking of plastic parts 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. Marking makes the sorting process simpler, however, when materials are sorted manually.

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

O33 Plastic: Recycled contents

The requirement applies if plastic is included with more than 10% by weight in the cleaning tool.

At least 30 wt% of the plastic in the cleaning tool must consist of recycled plastic*.

The recycled plastic must not be PVC or PVDC.

** See definition in section 4.2.*

Manufacturer of recycled must be stated.

Description and documentation from manufacturers of recycled raw materials showing that the plastic is recycled in compliance with the requirement's definition or has Global Recycle Standard certification or EuCertPlast certification, showing that the raw materials are recycled, or other equivalent certification approved by Nordic Ecolabelling.

Calculation that shows that the proportion of recycled plastic is met.

Background to requirement

With this requirement, Nordic Ecolabelling wants to stimulate circular material choices by using recycled or bio-based materials.

O34 Plastic: Chemicals in recycled plastic

Recycled plastic must not contain:

- brominated and chlorinated flame retardants
- phthalates
- cadmium
- lead
- mercury
- chromium (VI)
- arsenic

Impurities up to 100 ppm are permitted.

In addition, there must be a procedure in place to ensure that the recycled plastic does not risk exceeding the limit value in future deliveries.

- Documentation in the form of a test report (method XRF, X-ray) from the supplier of the recycled plastic, showing that the requirement is fulfilled. The analysis laboratory/test institute must meet the requirements in Appendix 2. Alternatively, the requirement can be documented by traceability to the source, showing that these substances are not present.

- Description/procedure indicating how it is ensured that the recycled plastic does not risk exceeding the limit value in future deliveries.

Background to requirement

The requirement applies to chemicals present in the recycled plastic raw material and not chemicals added during regranulation. The requirement is to be documented in the form of a test report following the use of X-ray fluorescence (XRF) or traceability to the source, indicating that the stated substances are not present. The purpose of the requirement is to address the very worst substances. Halogenated flame retardants and heavy metals can be harmful to health and the environment.

The halogenated flame retardants typically used in plastic are brominated and chlorinated[99], and it is therefore considered reasonable to only test for these types of flame retardant. Testing for all types of halogenated flame retardants would also increase the cost of testing.

A procedure/description from the plastic manufacturer/supplier showing how the requirement concerning the content of the substances will be fulfilled for future deliveries. This requirement has been introduced since recycled plastic may come from many different sources and the content of substances can therefore vary. The requirement can, for example, be documented by describing the sources of the plastic, the types of products from which the plastic originates and the typical use of brominated and chlorinated flame retardants, cadmium, lead, mercury, chromium IV, and arsenic in these product types. If tests for these substances are carried out, the requirement can be documented by having a procedure for how often and in which situations testing will be carried out.

O35 Plastic: Raw materials for bio-based polymers

If bio-based plastic is used the 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 meet either a) or b):

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 (GMO)***.

   Sugar cane must also be certified according to a standard that meets the requirements in Appendix 3.

[99] Report: Problematiske kemiske stoffer i plast, Danish Environmental Protection Agency 2014
https://mst.dk/service/publikationer/publikationsarkiv/2014/dec/problematiske-kemiske-stoffer-i-plast/

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 i.e., 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 either c) or d):

c) Be waste* or residual products**. There must be traceability to the production/process, where the residual production occurred.

d) Primary raw materials i.e., maize must not be genetically modified (GMO)***. 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.*

Test according to ISO 16620, ASTM D6866 or equivalent standard showing content of bio-based raw material.

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 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 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 to produce the polymer. Declaration that sugar cane is not genetically modified.

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

For background, please see requirement O6.

4.5.2 Chemicals used on and in cleaning tools

The requirements apply to chemicals used on and in materials that make up more than 5% by weight of the cleaning tool.

Requirements O36 and O37 apply for surface treatment of the cleaning tool, regardless of the materials it consists of. In addition, for surface treatment of metals requirement O38 applies and for surface treatment of plastics requirement O39 applies.

Requirement O40 applies to additives in plastic.

O36 Surface treatment: 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 considered antibacterial substances.

** In accordance with the definition of a nanomaterial adopted by the European Commission on 18 October 2011 (2011/696/EU), see definition in section 4.2.*

A declaration from the manufacturer of the cleaning tool stating that no chemical products and nanomaterial with antibacterial or disinfectant properties have been used on the surface of the finished cleaning tool.

Background to requirement

See background to requirement O24 for more information.

O37 Surface treatment: Nanomaterials

The chemical product used for surface treatment must not have nanomaterials* as ingoing substances*.

Exemption is made for pigments**.

** See definition in section 4.2.*

*** This exception does not include pigments added for purposes other than colour.*

A declaration from the chemical manufacturer that the chemical product does not include nanomaterials as ingoing substance.

Background to requirement

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[100,101,102,103,104,105,106]. 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 from 18 October 2011 (2011/666/EU) is used.

Most nanomaterials on the market today have either been in use for decades or existing materials have recently been manipulated into nanoforms. For example, nanoparticles of carbon black and amorphous silica (SiO_2) have been used in the last century. Titanium dioxide, TiO_2, has long been used as a dye in bulk form, but is now produced as a nanomaterial for other purposes. It is expected that other types of engineered nanomaterials will enter the market in the future.

Within cleaning tools, nanomaterials may be 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 paints, inks, textile dyes, masterbatch etc. and many pigments consist wholly or partly of nanoparticles. Therefore, nano-sized pigments are exempted. Although no clear conclusions can be drawn about the safety of nano pigments, 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. 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. Carbon black used in paints is very

[100] 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
[101] 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=aHR0cDovL2Fzc2VtYmx5LmNvZS5pbnQvbncveG1sL1hSZWYvWDJILURXLWV4dHIuYXNwP2ZpbGVpZD0xOTczMCZsYW5nPUVO&xsl=aHR0cDovL3NlbWFudGljcGFjZS5uZXQvWHNsdC9QZGYvWFJlZi1XRC1BVC1YTUwyUERGLnhzbA==&xsltparams=ZmlsZWlkPTE5NzMw
[102] 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.
[103] 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
[104] 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
[105] 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
[106] 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

finely ground and has a particle size of approx. 10–30 nm. 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.

O38 Surface treatment of metals: Coating/plating/galvanizing

Metals must not be coated/plated/galvanized with cadmium, chromium, lead, nickel, zinc, or compounds of these.

A declaration from the manufacturer of the cleaning tool.

Background to requirement

The requirement covers coating, plating, galvanizing and metallisation with cadmium, chromium, lead, nickel, zinc, or compounds of these.

These metals have adverse effects on human health and the environment. They have several classifications, e.g., Chromium VI is classified as H317, H400, H410 and H350. Nickel plating salts e.g., $NiCl_2$, are classified as H350, H341 and H360D. Nickel is known to cause allergies as small amounts of nickel are released from the coating upon contact with skin[107]. Lead is a toxic heavy metal that is accumulated in nature and in human beings. This means that even small quantities of lead can be harmful to health. Cadmium and cadmium compounds are acutely and chronically toxic for human beings and animals. Most cadmium compounds are also carcinogenic.

O39 Surface treatment of plastic: Type of surface treatment

No surface treatment other than printing and painting is allowed.

A declaration from the manufacturer of the cleaning tool.

Background to requirement

Surface treatment of plastic can negatively affect the possibilities for recycling of the plastic, therefore only surface treatment in the form of prints and paints used for decoration is allowed.

O40 Additives in plastic

Additives* in the list below must not be added to plastic (both virgin and recycled plastic). The requirement applies to additives actively added to the polymer raw material in the master batch or compound in production of plastic.

- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury, and their compounds
- Halogenated organic compounds with the following exception:
  - 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
- Phthalates
- Bisphenols

* *See section 4.2 Definitions.*

[107] Shane Donatello, Hans Moons and Oliver Wolf, Revision of EU Ecolabel criteria for furniture products, final technical report, 2017

A declaration from the plastic producer.

Background to requirement

Please see background in requirement O20.

4.6 Quality and performance requirements

The requirements in this section apply for the finished textile part.

O41 Dimensional changes after washing and drying

The requirement only applies for microfibre products that are to be fitted on a cleaning tool, e.g., a mop.

The textile part must not change more than 6% in dimension after washing and drying.

Test method: EN ISO 6330, combined with ISO 5077: Three washes at the temperature specified on the product and tumble drying after each wash cycle unless the product specifies another method of drying.

Information regarding dimensional changes (%) must be provided on the packaging and/or in other product information.

Test report and results according to requirement. The analysis laboratory must fulfil the requirements in Appendix 2.

Copy of information on the packaging and/or in other product information regarding dimensional changes (%).

Background to requirement

The requirement has been set to ensure the high quality of the Nordic Swan Ecolabelled products. Since the textile part may contain various types of fibre, including natural fibres, dimensional changes during washing must be checked. Dimensional change is an important quality parameter e.g., mops must fit the cleaning tools even after repeated washing.

O42 Colour fastness to washing

Colour fastness to washing shall at a minimum be level 3-4 for change in colour and at least level 3-4 for staining. Tests shall be performed on the colour(s) in a series that are anticipated to be least colour fast. This requirement does not apply to uncoloured and/or white products.

Test method: ISO 105-C06.

Test report and results according to requirement. The analysis laboratory must fulfil the requirements in Appendix 2.

Background to requirement

The requirement has been set to ensure the high quality of the Nordic Swan Ecolabelled products. Since the textile part must be washable in water, requirements are specified in relation to colour fastness. Colour fastness is an important quality parameter that influences the use and washing of the dyed product. Colour fastness to washing is most relevant for the product group, compared to e.g., colour fastness to dry or wet rubbing.

O43 Durability

The textile part must be durable and have a long service life. This means that after the number of washes states below the product must still be effective and live up to requirement O44 and if relevant requirement O45.

Products for professional use - durable after at least 500 washes.

Products for domestic use - durable after at least 200 washes.

Test method: Washing and reporting according to guideline in Appendix 5. Hereafter documentation according to requirement O44 and if relevant requirement O45.

Information regarding durability (number of washes that the product minimum can last and retain cleaning performance) must be provided on the packaging and/or in other product information, see requirement O49.

Report according to Appendix 5.

Declaration from the applicant that the washed products are those that are sent to testing according to requirement O44 and if relevant requirement O45.

Background to requirement

The requirement is set to ensure high quality and long service life of the product. A long service life of the product is a very important factor regarding the environmental impact of a product. When a product can last for a longer time less recourses are used to make new products.

Products containing microfibre generally offer good cleaning performance. However, the cleaning performance can deteriorate after several washes. In addition, certain products may be treated with chemicals to improve performance, for example with salts/absorbers that improve absorption. This performance diminishes with each wash as the chemicals are washed out and the performance of the product can deteriorate considerably. To ensure that the unique properties of microfibre do not diminish following washing, the cleaning performance must be tested following a specific number of washes to demonstrate the product's optimum service life (of acceptable function) during a period of use of at least one year. According to information received, consumers wash products considerably less often than professional users (50-100 times/year compared to 200+ times/year). This is because professional products are used significantly more often than those products aimed at the domestic consumer. The number of washes have, therefore, been adapted to each type of product. Domestic products are to be tested after 200 washes, and products intended for professional users are to be tested after 500 washes. A durability of 500 washes for high end professional products are often claimed by manufactures of microfibre cloths and mops.

In addition, the manufacturers must guarantee and inform customers regarding the number of washes after which the product should be able to last and retain cleaning performance, see requirement O49.

O44 Removal of dust and dirt

It must be demonstrated that a microfibre cloth or pad removes at least 85% of dust and dirt and a microfibre mop at least 70% of dust and dirt after at least 200/500 washes, see requirement O43.

The use method (damp or dry use) of the product shall be used when testing. If a product is designed for both damp and dry use, its performance must be tested for both. No cleaning or disinfectants chemicals must be used.

For other products than cloth, pad or mop Nordic Ecolabelling shall be contacted regarding which level of dust and dirt removal that shall be fulfilled.

Test method: See recommendations on testing in Appendix 6. Standard INSTA 800 or EN 13549 may, for example, be used as a starting point for designing tests. Washing according to requirement O43.

Test report and results according to requirement. The analysis laboratory must fulfil the requirements in Appendix 2.

Background to requirement

If a product is designed for both damp and dry use, its performance regarding dust and dirt removal must be documented for both applications. Only water may be used, no cleaning or disinfectants chemicals.

Cloths, mops, and other products containing microfibre generally offer good cleaning performance. There are currently few test methods that provide an objective evaluation of cleaning performance. A subjective, visual evaluation is still the most common. Methods used differ greatly and few are standardised. In addition, the areas of use for cloths and mops are wide. The Nordic cleaning standard “INSTA 800” or the European standard “EN 13549 Cleaning services Basic requirements and recommendations for quality measuring systems” may, for example, be used as a starting point for designing tests. Other test methods may also be used if the recommendations in Appendix 6 are followed.

O45 Assessment of hygienic conditions (measurement of quantities of micro-organisms)

This requirement applies only to products marketed as possessing the ability to reduce the presence of micro-organisms under various conditions.

It must be demonstrated that the product reduces the number of micro-organisms by at least 99% (cfu = colony forming units) after at least 200/500 washes, see requirement O43.

The use method (damp or dry use) of the product shall be used when testing. If a product is designed for both damp and dry use, its performance must be tested for both applications. No cleaning or disinfectants chemicals must be used.

Test method: See recommendations on testing in Appendix 6. Standard INSTA 800, EN 13549 or EN 16615 may, for example, be used as a starting point for designing tests. Washing according to requirement O43.

Test report and results according to requirement. The analysis laboratory must fulfil the requirements in Appendix 2.

Background to requirement

If a product is designed for both damp and dry use, its performance regarding micro-organism reduction must be documented for both applications. Only water may be used, no cleaning or disinfectants chemicals.

This requirement applies only to products marketed as possessing the ability to reduce the presence of micro-organisms under various conditions. The purpose of testing is to check that the result of cleaning of surfaces is acceptable in terms of hygiene, but not necessarily at the level for disinfection.

Measurement of quantities of micro-organisms may be performed using different growth substrates. Results may be presented in terms of the individual levels of the most common micro-organisms or as a total quantity of micro-organisms for a certain area (25 cm^2). Micro-organisms are often cultivated from samples taken from a variety of cleaned surfaces to determine either the quantity or types of micro-organisms present.

There are several different quality levels for the measurement of microorganisms on surfaces, based on guidelines for cleaned surfaces. Hygiene measurements are carried out according to agreement with partners. Such agreements, dealing with requirement levels, measurement frequency and measurement objects, vary according to the type of activities or operations involved, but are always collated under one term – "Hygiene requirements". Information suggests that cloths and mops containing microfibre can reduce levels of micro-organisms by a relatively large amount when used without chemicals (up to 99%). Such cleaning performance can, however, vary depending on the type of surface to be cleaned and the cleaning methods applied (damp or dry). When cloths for damp and dry use have been tested on different types of surfaces, a significant difference in the reduction achieved by each cloth has been demonstrated between dry and damp use as well as in relation to the type of test surface: wood or laminate. Reductions of between 48–100% have been noted in the case of laminate surfaces, and between 59–99% for lacquered wood surfaces.

There are currently few test methods that provide an objective evaluation of cleaning performance. A subjective, visual evaluation is still the most common. Methods used differ greatly and few are standardised. In addition, the areas of use for cloths and mops are wide. The Nordic cleaning standard "INSTA 800", the European standard "EN 13549 Cleaning services Basic requirements and recommendations for quality measuring systems" or "EN 16615 Chemical disinfectants and antiseptics – Quantitative test method for the evaluation of bactericidal and yeasticidal activity on non-porous surfaces with mechanical action employing wipes in the medical area (4- field test) – Test method and requirements (phase 2, step 2)" may, for example, be used as a starting point for designing tests. Other test methods may also be used if the recommendations in Appendix 6 are followed.

O46 Abrasion

The product, when used as recommended, must not cause any type of damage to the cleaned surface.

The qualitative results of gloss measurements must not exceed the following gloss differential limits:

- Semi-hard and hard surfaces: <30 gloss differential
- Soft and fragile surfaces: <20 gloss differential

Test method: According to ISO 12947-1 and gloss measurement according to DIN 67530 or ISO 2813, or equivalent test methods.

Or guarantee that the use of the supplies for microfibre based cleaning does not cause surface damage during recommended usage. The information about the guarantee shall be presented on the packaging, instruction, or product data sheet.

Test report and results according to requirement. The analysis laboratory must fulfil the requirements in Appendix 2.

or

Copy of information on the packaging, instruction or product data sheet that guarantees that the product will not cause surface damage during recommended usage.

Background to requirement

Low abrasion is an important quality parameter for supplies for microfibre based cleaning such as cloths and mops. The use of such products must not cause permanent damage to surface when used as recommended. The requirement can either be documented by testing the loss of gloss of the surfaces or by a guarantee that the product will not cause surface damage. The information about the guarantee must be communicated on the packaging, instruction, or product data sheet.

O47 Absorption

This requirement applies only to products that are marketed for uses requiring absorption properties, for example damp cleaning.

The test shall be performed on the newly produced microfibre textile.

If several different types of microfibre textile are contained in the end product, then the requirement is to be met by the particular type of microfibre intended for use in absorption.

The absorption capacity of the microfibre textile shall be expressed as:

DAC (Demand absorption capacity) in g/g – minimum 2.50 g/g and MAR (Maximum absorption rate) in g/s – minimum 0.6 g/s.

Test method: According to EN ISO 9073-12, or equivalent test methods.

Test report and results according to requirement. The analysis laboratory must fulfil the requirements in Appendix 2.

Background to requirement

The degree of splitting influences the properties of the final product, such as its cleaning performance and absorption. This means that splitting can be measured indirectly through absorption, which is an important functional parameter of the microfibre. Absorption tests are performed during production, as a type of quality control. This means it is reasonable to set requirements on absorption. The textile is knitted or woven and then set for splitting and dyeing, which is carried out in the same bath. Thus, the requirement can only apply to the microfibre weave and not the final product, as this contains other materials.

To ensure that the absorptive powers of the final product arise mainly from microfibre, a test is to be carried out on newly produced microfibre textiles. This test is not to be performed on the final supplies for microfibre based cleaning, in which other materials with absorptive powers may be present. It is the responsibility of the manufacturer to produce a product that works well and can demonstrate possession of both absorptive and cleaning powers, i.e., choose how large a proportion by weight of microfibre the product is to contain, where these are to be placed in the construction and which types of microfibre are to be used in the product. The manufacturer also considers whether there is reason to use other materials – for instance as a way of keeping the construction upright. The most important factor for Nordic Ecolabelling is that the best microfibres, those which fulfil the requirements, are available for use. The term ”best” refers to microfibres with good functional properties, with good capacity for dirt removal

and absorption if such qualities are required. This requirement only applies to products marketed as possessing high absorptive powers in use, for example in damp cleaning.

O48 Loss of fibre fragments

Fabrics, included with more than 10% by weight in the finished textile part and consisting of at least 90% by weight of synthetic fibres, shall be tested for loss of fibre fragments according to either the TMC test method or standard ISO/DIS 4484-1.

Nordic Ecolabelling can insert a limit value in the requirement when a relevant rating system with applicable limit values has been developed.

Nordic Ecolabelling encourages that test results be sent to TMC (The Microfibre Consortium) as a basis for developing a rating system.

Test report showing that the requirement is fulfilled. The analysis laboratory must fulfil the requirements in Appendix 2.

Background to requirement

Loss of fibre fragments from washing of textiles is an area of great focus because this can lead to microplastic contamination of the aquatic environment. However, recognized standardized test methods just recently have been developed for determining the loss of fibre fragments when washing textiles in household washing machines. Although, these test systems are not ready to define specific limit values, Nordic Ecolabelling considers it important to start testing. Later, when enough knowledge and data are collected, limit values can be inserted in the requirement. At the same time, a test for loss of fibre fragments will already provide manufacturers with information about their textiles, as well as provide data for the work of developing a rating system. Nordic Ecolabelling encourages test results to be shared with, for example, TMC (The Microfibre Consortium), which needs this data to be able to develop a rating system.

4.7 Instructions and labelling

The requirements of this section apply to the final product that are sold to the customer.

O49 Instructions

The instructions shall contain:

- Information on the surfaces for which the products are designed.
- Information on the correct use without cleaning chemicals.
- Statement of guaranteed service life (number of washes that product can withstand without impairing function) when used according to recommendations.
- Laundry instructions with directions regarding care as well as recommended and maximum washing temperatures.

Instructions according to the requirement.

Background to requirement

Supplies for microfibre based cleaning are to be used on recommended surfaces to achieve the best cleaning results without causing damage to the surface. Accordingly, it is vital that the supplier provides complete information about the surfaces for which the product is intended.

Clear washing and care instructions are to be provided with ecolabelled products. This requirement is intended to make it easier to use and care for supplies for microfibre based cleaning in accordance with the manufacturer's recommendations. For example, no fabric softeners or bleaching agents shall be used when washing microfibre products since these can impair cleaning performance. The products must not be mixed with other types of laundry that can shed fluff and thereby impair the cleaning effectiveness of the microfibre product.

It must be possible to wash the product under conditions that allow the product to retain its cleaning performance over a long period of time. Instructions for maximum temperatures must be stated.

To take into consideration possible energy savings during washing, a text regarding reducing the washing temperature must be in the instructions when the products are not marketed as intended for particular hygienic conditions.

The end user must be informed that the products should be used without cleaning chemicals to optimise the benefits of using ecolabelled supplies for microfibre based cleaning.

Durability is one of the most important environmental and quality parameters for ecolabelled supplies for microfibre based cleaning. Therefore, the manufacturers and suppliers of the products must inform the customer of the guaranteed service life of the product (number of times that the product may be washed without impairing function) when used according to the recommendations provided.

O50 Labelling

Supplies for microfibre based cleaning shall be labelled so that they are easily identifiable and distinguishable from other cleaning products. The product must be labelled as containing microfibre materials. Clear laundry instructions with specific directions for care and washing temperature must also be supplied with the product.

A description or similar stating both laundry instructions and the labelling that clearly identifies the product as containing microfibre.

Background to requirement

This requirement is set to make it easier for the user to distinguish microfibre cloths and mops from other fabric cleaning products, which in turn makes it easier to use and care for the product as recommended by the manufacturer and thus maintain its cleaning performance.

4.8 Social and ethical requirements

O51 Fundamental principles and rights at work

The applicant must ensure that all dyeing plants and cut-make-trim (CMT) factories (e.g., sewing factories) used in the manufacture of the licensed product(s) comply with:

- Relevant national laws and regulations
- The International Labour Organisation (ILO) Conventions below

ILO Conventions:

1. Prohibition of forced labour (ILO Conventions No. 29 and 105)
2. Freedom of association, and protection of the right to organise and to conduct collective bargaining (ILO Conventions No. 87, 98, 135 and 154)
3. Prohibition of child labour (ILO Conventions No. 138, 182 and 79 plus ILO Recommendation No. 146)
4. No discrimination (ILO Conventions No. 100 and 111, UN Convention on the Elimination of All Forms of Discrimination against Women)
5. No violent treatment – Physical abuse or punishment, and threats of physical abuse are prohibited. The same applies to sexual or other forms of harassment.
6. Workplace health and safety (ILO Convention No. 155 and ILO Recommendation No. 164)
7. Fair pay (ILO Convention No. 131)
8. Working hours (ILO Conventions No.1 and 14)

Certification: The applicant shall submit either a valid certificate of a SA8000 certification, or other third-party verification of compliance with the requirement. This may be a BSCI audit report.

If the manufacturer is in the process of becoming SA8000 certified, this may be accepted under the following conditions: Final report from the certification body, including action plan with stated deadlines, submitted for assessment.

Procedure: The applicant must have:

- A code of conduct with its subcontractors
- A publicly available policy adopted by the Board of Directors, which at least covers the social and ethical obligations that the requirement covers. At least one person at management level must be responsible for policy compliance.
- A routine for internal communication and regular follow-up of this policy in own company and in the supply chain.
- A routine for performing regular risk analysis to identify and prioritize the risk of non-compliance of the requirements and perform risk-reducing measures.

Nordic Ecolabelling may withdraw the ecolabel licence, if the licensee no longer fulfils SA8000 (or other corresponding certification) or does not meet the stated deadlines in any action plans.

SA8000 certificate or other third-party verification of compliance with the requirement incl. latest audit report e.g., a BSCI audit rapport.

Description of code of conduct, policy and routine as required by the requirement.

Background to requirement

The requirement refers to the UN's Universal Declaration of Human Rights[108], which deals with respect for and the upholding of human rights, and the International Labour Organisation's (ILO) Conventions on relevant rights at work and OECD Due Diligence Guidance for Responsible Business Conduct. These are recognised and widely used frames of reference for businesses in their work on human rights and workers' rights, and they underpin most of the

[108] https://www.un.org/en/universal-declaration-human-rights/index.html

systems and guidelines that address human rights, such as the OECD, ISO 26000, SA8000, the UN Global Compact, the UN Guiding Principles, and the Ethical Trading Initiative.

A new report from April 2019, compiled by Human Rights Watch[109], shows that low purchase prices and shorter lead times for textiles, combined with unfair sanctions and poor terms of payment, increase the risk of occupational accidents in textile factories. The severe financial pressure that many textile brands are putting their suppliers under gives those suppliers powerful incentives to cut costs in ways that worsen working conditions.

Many brands demand that their suppliers uphold key workers' rights, while at the same time pressuring and encouraging them to do the opposite. It is therefore considered relevant to expand the current requirement to include at least four new areas that are subject to ILO Conventions: "No violent treatment", "Workplace health and safety" (ILO Convention No. 155 and ILO Recommendation No. 164), Fair pay (ILO Convention No. 131) and Working hours (ILO Conventions No. 1 and 14).

An SA8000 certificate with, for example, a BSCI audit report covers the ILO Conventions contained in the requirement[110]. A BSCI audit report may therefore be used as documentation for the requirement.

5 Licence maintenance

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

O52 Control and assessment of suppliers

The licensee shall do an annual follow-up of its own suppliers, who perform relevant processes (e.g., textile dyeing, textile finishing, surface treatment of tool) during the textile and cleaning tool production. The follow-up shall be documented in writing and shall contain the following, as a minimum:

- List of used suppliers, who perform relevant processes.
- Check that the supplier's responsible person is familiar with Nordic Ecolabelling's requirements and understands how the supplier can ensure compliance with these.
- Check that procedures at the supplier have been implemented to ensure that changes are only made to the production of the Nordic Swan Ecolabelled product (e.g., changes to raw materials) once the licensee has obtained approval from Nordic Ecolabelling.
- If any of the requirements in the criteria are documented via certification schemes (e.g., Oeko-Tex 100, Global Recycled Standard certificate, EU Ecolabel or similar) or yearly tests, checks are to be carried out to ensure that certificates and tests are up to date and remain valid.

[109] "Paying for a Bus Ticket and Expecting to Fly" How Apparel Brand Purchasing Practices Drive Labor Abuses, 2019 https://www.hrw.org/sites/default/files/report_pdf/wrd0419.pdf
[110] amfori BSCI Code of Conduct, https://www.bsci-intl.org/sites/default/files/amfori%20BSCI%20COC%20UK_0.pdf?_ga=2.176261411.72067964.1557828371-2066962727.1556691248 accessed 14.05.2019.

Changes in the production such as replacement of suppliers or additional suppliers, fibre raw materials or chemicals shall be approved by Nordic Ecolabelling before the change is initiated in production.

If deviations are found at the annual follow-up, the Nordic Ecolabelling must be contacted.

The licensee shall keep written documentation for each year of the validity of the license. If requested documentation must be send to Nordic Ecolabelling.

A draft of the annual follow-up document, which shows how it is set up. The document shall show which points for each supplier are going to be followed up, how it can be seen when they have be checked and how they have been assessed (e.g. approved, not approved). For each suppliers the name of the company and which process they preform must also be stated.

Confirmation that follow-up of suppliers will be done each year of the validity of the license.

Background to requirement

The requirement has been set to ensure that the license follows the actual production of the Nordic Swan Ecolabelled supplies for microfibre based cleaning.

O53 Customer complaints

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

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

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

Background

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.

O54 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

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 Changes compared to previous generation

Overview of changes from 2 generation to generation 3 of the criteria for Supplies for microfibre based cleaning. Where the changes are minor this is stated in the table.

Requirement generation 3	Requirement generation 2	Same requirement	Change of requirement	New requirement
O1	R2		x	
O2				x
O3	R3		x (minor)	
O4				x
O5				x
O6				x
O7	R6		x	
O8	R7		x	
O9	R8	x		
O10				x
O11	R5		x	
O12-O16	R9		x	
O17	R10		x (minor)	
O18				x
O19	R15		x	
O20	R13, R14, R17, R18		x	
O21-O25				x
O26	R19		x	
O27				x
O28	R27	x		
O29	R28		x	
O30	R30		x	
O31	R30		x	
O32	R30		x (minor)	
O33	R32		x (minor)	
O36-O37				x
O38	R29		x (minor)	
O39	R34		x	
O40	R33		x (minor)	
O41-O42	R20-R21	x		
O43				x

O44-O45	R35-R36		x	
O46-O47	R37-R38	x		
O48				x
O49	R41		x (minor)	
O50	R42	x		
O51				x
O52				x
O53-O54	R43-R49		x	

Criteria version history

Nordic Ecolabelling adopted version 3.0 of the criteria for XX on DAY MONTH YEAR. The criteria are valid until DAY MONTH YEAR.

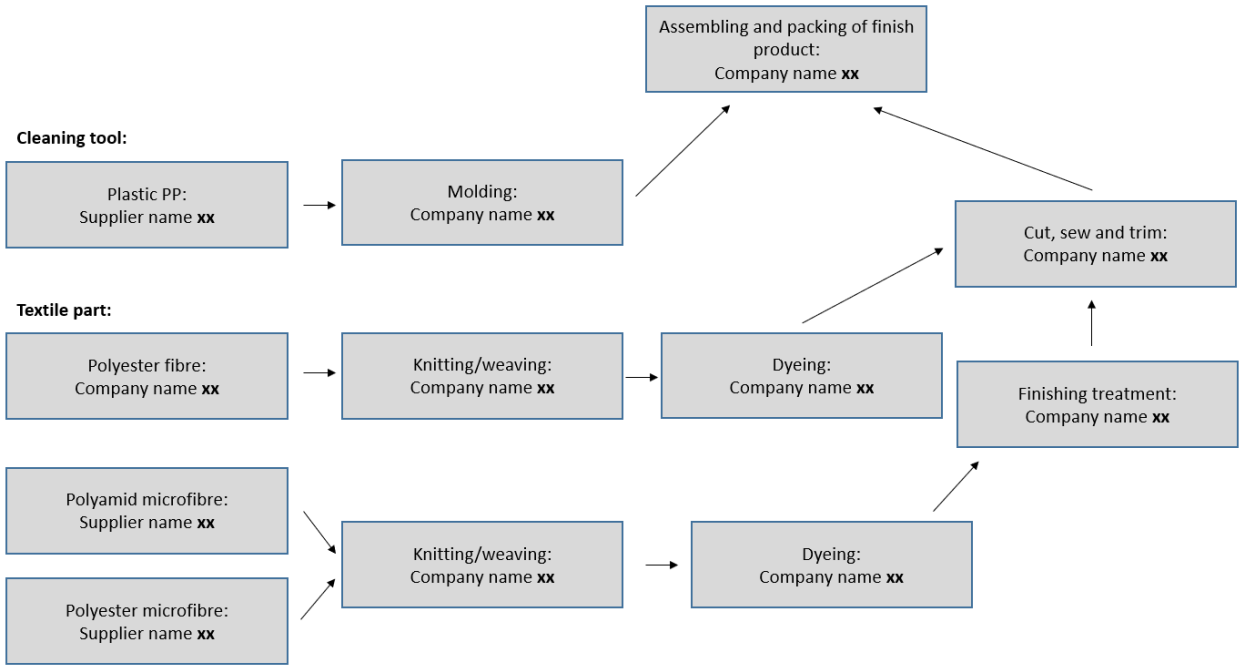
New criteria

In the next generation of the criteria, it is possible that the following areas i.e., will be revised or included:

- Specific requirements for energy and water consumption during textile production
- Amount of recycled textile fibres in the product
- Amount of loss of fibre fragments from the product

Appendix 1 Manufacturing process and suppliers

Example of flow chart:



Suppliers:

Company name	Production site (Full address)	Contact person (Name, e-mail, and phone)	Manufacturing process (e.g., dyeing, surface treatment, etc.)

Appendix 2 Laboratories for testing, sampling, and analysis

General requirements

The laboratory/institute must be competent and impartial.

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

The applicant's own 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:

- testing, sampling, and analysis is monitored by the authorities, or
- the manufacturer's quality assurance system covers testing, analyses and sampling and is certified to ISO 9001, or
- the manufacturer can demonstrate agreement between a first-time test conducted at the manufacturer's own laboratory and testing carried out in parallel at an independent test institute, and the manufacturer takes samples in accordance with a fixed sampling schedule.

Appendix 3 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 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.

Appendix 4 Azo dyes and aromatic amines

Carcinogen aromatic amines	CAS no
4-aminodiphenyl	92-67-1
Benzidine	92-87-5
4-chlor-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-diaminoanisol	615-05-4
4,4´-diaminodiphenylmethane	101-77-9
3,3´-dichlorbenzidine	91-94-1
3,3´-dimethoxybenzidine	119-90-4
3,3´-dimethylbenzidine	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-pphenylenediamine; 2,5diaminotoluene	615-50-9
2-methyl-pphenylenediamine; 2,5diaminotoluene	95-70-5
2-methyl-pphenylenediamine; 2,5diaminotoluene	25376-45-8
6-chloro-2,4-dinitroaniline	3531-19-9

Appendix 5 Guideline for washing and report

This guideline shall be used for washing of the products.

The washing and reporting may be performed by the applicant, the manufacture of the product, a laundry, or an analysis laboratory**.**

Washing machine type:
For products for professional use: Washing machine that are designed for professional washing or are according to ISO 15797 must be used.
For products for domestic use: Washing machine types according to EN ISO 6330 must be used.

Washing detergents:
Use detergents with a pH between 4 and 10. Use detergents without soap and zeolites.
Dose according to specified for the detergent used and according to the water hardness used for washing.
Do not use fabric softeners.

Tumble drying:
Tumble drying between washing cycles may be used but is not a requirement.

Washing procedure:
Wash at the maximum temperature specified for the product.
Use a washing program which include minimum 20 minutes of washing followed by minimum 3 rinsing cycles with spin drying between each.

- Products for professional use: 500 washing cycles.
- Products for domestic use: 200 washing cycles.

Reporting:
A report must be submitted to Nordic Ecolabelling containing:

- Information about who has performed the washing.
- The trade name/ item number of the washed products.
- Confirming the use of washing machine type according to EN ISO 6330 or ISO 15797/for professional washing, respectively.
- Information about the detergent used and the dosage.
- Stat if tumble drying has been used or not.
- Describe the washing procedure including information about washing temperature and washing program.
- State the numbers of washing cycles.

Appendix 6 Removal of dust and dirt and measurement of reduction in micro-organisms

Removal of dust and dirt

The Nordic cleaning standard "INSTA 800" or the European standard "EN 13549 Cleaning services Basic requirements and recommendations for quality measuring systems" may, for example, be used as a starting point for designing tests.

- Measurement of degree of dust and dirt removal shall be performed with a test instrument, e.g., Dust Detector (or similar instrument with equivalent scale and accuracy). The instrument must be calibrated in accordance with the supplier's instructions.
- Measurements shall be performed on a suitable test service. The applicant must state the test surface that has been used and specify why this test surface has been chosen.
- If the supplies for microfibre based cleaning is designed for both damp and dry use, its performance regarding dust and dirt removal must be documented for both applications. Only water may be used, no cleaning or disinfectants chemicals.
- The test results must be presented for each surface category and the date of testing stated.
- A representative quantity and composition of dirt for the floor or surface shall be used in testing. The applicant shall describe and justify the type and quantity of dirt that is used.
- A relevant test method must be used, such as wiping/mopping with 50% overlap. The applicant shall describe and justify the test method that is employed.
- The reproducibility of results must be documented.

Measurement of quantities of micro-organisms

The Nordic cleaning standard "INSTA 800", the European standard "EN 13549 Cleaning services Basic requirements and recommendations for quality measuring systems" or "EN 16615 Chemical disinfectants and antiseptics – Quantitative test method for the evaluation of bactericidal and yeasticidal activity on non-porous surfaces with mechanical action employing wipes in the medical area (4- field test) – Test method and requirements (phase 2, step 2)" may, for example, be used as a starting point for designing tests.

- Hygiene measurements shall be used to measure the quantity of micro-organisms on all flat, hard, and semi-hard surfaces. The purpose of testing is to check that the cleaning result is acceptable regarding hygiene requirements.

- Measurements only apply to total bacteria counts (number of colonies of microorganisms that develop through cultivation of a swab or impression sample on trypton-glycose-yeast extract agar). If the applicant wishes to measure the type and number of a specific type of microorganism, the method and limit value must be justified.
- Measurement shall be performed using contact plate or agar strips with nutrient (TGA) or equivalent. Other growth cultures may be used.
- Measurements shall be performed on a suitable test service. The applicant must state the test surface that has been used and specify why this test surface has been chosen.
- If supplies for microfibre based cleaning are designed for both damp and dry use, their performance in reducing the presence of micro-organisms must be documented for both uses. Only water may be used, no cleaning or disinfectants chemicals.
- The test results must be presented for each surface category and the date of testing stated.
- The reproducibility of results must be documented.