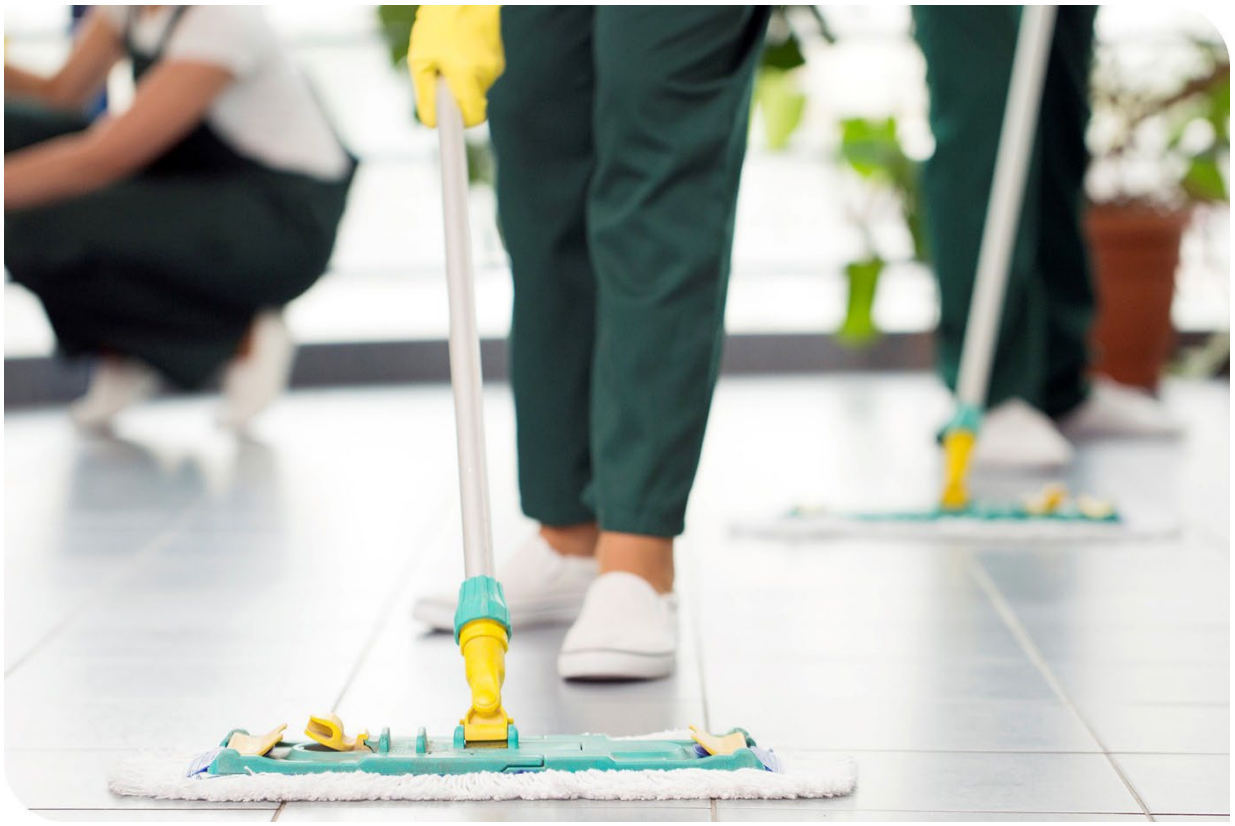
About Nordic Swan Ecolabelled

Supplies for microfibre based cleaning



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Nordic Ecolabelling

Content

Contact information

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

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What is Nordic Swan Ecolabelled Supplies for microfibre based cleaning?

Nordic Swan Ecolabelled supplies for microfibre based cleaning have a reduced environmental impact throughout its life cycle and have a first-rate cleaning performance without the use of cleaning chemicals. There are requirements for textile fibres, for constituent materials of the cleaning tools, chemicals used in production of textiles, production of textile and circular aspects such as quality and material recycling. Also, the textile producers are committed to continuous improvements to ensure that production complies with UN's International Labour Organization (ILO) conventions on workers' rights.

The requirements promote a more circular economy, reduce climate impact, and save resources: Supplies for microfibre based cleaning with the Nordic Swan Ecolabel must be durable (have a long service life) and have a high cleaning quality, which must be tested and documented. A high proportion of the textile fibres and of the materials in the cleaning tools must be of recycled origin or based on renewable resources. At the same time several of the Nordic Swan Ecolabel requirements support that the materials of the cleaning tool can be recycled in new resource loops after use.

Nordic Swan Ecolabelled supplies for microfibre based cleaning:

- Offer a first-rate cleaning performance without the use of cleaning chemicals.
- Are durable which promote a long service life and resource efficiency.
- Are tested for loss of fibre fragments (e.g., microplastic).
- Are gentle on the surface being cleaned.
- Minimum 25% of the polyester fibres are recycled or based on renewable resources complying with specific environmental requirements.
- Meet strict environmental and health requirements for chemicals used in textile manufacturing - this is important for wastewater, the people who manufacture the textiles and those who use them.
- Are manufactured at productions sites that are committed to continuous improvements to ensure working conditions in line with national law and International Labour Organizations Conventions (ILO).

Why choose the Nordic Swan Ecolabel?

- The licensee may use the Nordic Swan Ecolabel trademark for marketing. The Nordic Swan Ecolabel is a very well-known and well-reputed trademark in the Nordic region.
- The Nordic Swan Ecolabel is a simple way of communicating environmental work and commitment to customers.
- The Nordic Swan Ecolabel clarifies the most important environmental impacts and thus shows how a company can cut emissions, resource consumption and waste management.
- Environmentally suitable operations prepare supplies for microfibre based cleaning for future environmental legislation.

- Nordic Ecolabelling can be seen as providing a business with guidance on the work of environmental improvements.
- The Nordic Swan Ecolabel not only covers environmental issues but also quality requirements since the environment and quality often go hand in hand. This means that a Nordic Swan Ecolabel licence can also be seen as a mark of quality.

1 Summary

Cloths, mops, and pads containing microfibres (i.e., fibres less than 1 decitex (Dtex) thick) can be used for wet, damp or dry 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 25% 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.

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.

[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

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 300 washes and domestic products after 100 washes.

The requirement regarding assessment of hygienic conditions has 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 overview of the changes in the revised version, please see section 6 of the background document.

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)):	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.

	Land use. Energy resources for cultivation, harvesting and fertilizer. Water for cultivation. Energy resources for production. 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 for the production of 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 for the production of 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 monoethylene 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 the amount of 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 are 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.
Cleaning tool**s 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, 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 amount 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
- **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**.

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
- 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 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 and a private lab has developed a test specifically adapted to cleaning textiles. However, more knowledge is still needed about which characteristics of textile production are most important for the release of microplastics.

[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.

More knowledge is needed

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 there is a need for more 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] Such methods are under development. 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. The standardized test methods are not adapted specifically to cleaning textiles. However, building upon these methods, the Weber & Leucht Laboratory has developed a test that simulates the loss of fibre fragments from cleaning textiles during their lifetime. This test method is now publicly available. Nordic Ecolabelling requires this test and excludes cleaning 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 because they more easily attract environmental toxins, which are then transported with the fibres.[14,15] In addition, cellulosic fibres degrade.

[4] Henry B, Laitala K, Klepp IG (2019) Microfibres from apparel and home textiles: Prospects for including microplastics in environmental sustainability assessment. Science of the Total Environment 652:483–94.
[5] Ramasamy R, Subramanian RB (2021) Synthetic textile and microfiber pollution: a review on mitigation strategies. Environment Science and Pollution Research 28(31):41596–41611.
[6] Roos S, Arturin OL, Hanning AC (2017) Microplastics shedding from polyester fabrics. Mistra Future Fashion Report number 2017:1. Swerea
[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.
[9] Cesa FS, Turra A, Baruque-Ramos J (2017) Synthetic fibers as microplastics in the marine environment: A review from textile perspective with a focus on domestic washings. Science of the Total Environment 598:1116–1129.
[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).
[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.

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 consumer washing machines have 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.

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

[16] Brodin M, Norin H, Hanning AC, Persson C, Okcabol S. (2018) Microplastics from Industrial Laundries - A Study of Laundry Effluents. The Swedish Environmental Protection Agency.
[17] Vassilenko E, Watkins M, Chastain S, Mertens J, Posacka AM, Patankar S, Ross PS (2021) Domestic laundry and microfiber pollution: Exploring fiber shedding from consumer apparel textiles. PLoS ONE 16(7): e0250346
[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
[19] McIlwraith HK, Lin J, Erdle LM, Mallos N, Diamond ML, Rochman CM (2019) Capturing Microfibers – Marketed Technologies Reduce Microfiber Emissions from Washing Machines. Marine Pollution Bulletin 139:40–45.
[20] www.oceancleanwash.org/solutions/solutions-for-consumers (04.02.2022).
[21] Vassilenko K, Watkins M, Chastain S, Posacka A, Ross P (2019) Me, My Clothes and the Ocean: The Role of Textiles in Microfibre Pollution. Ocean Wise Conservation Association.
[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 https://www.ri.se/sv/vad-vi-gor/projekt/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/, the organisation OceanWise and American apparel companies https://ocean.org/action/microfiber-partnership/, and the organisation The Microfibre Consortium https://www.microfibreconsortium.com/ (05.09.2022)

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 wet, damp and/or dry 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/fibres	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.
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 in polymers	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.

Background to requirement O1 Description of the product, material composition and limits

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.

Background to requirement O2 Description of the production chain and the manufacturing processes

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.

Background to requirement O3 Textiles certified with the Nordic Swan Ecolabel or EU Ecolabel

Textiles that are certified according to the Nordic Swan Ecolabel and EU 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 is present with a total amount of maximum 5% by weight of the textile part is exempt from the requirements in section 4.4.1.

Textile fibres that are not subject to any fibre requirements in section 4.4.1may account for no more than total 5% by weight of the textile part.

Background to requirement O4 Recycled fibres: Synthetic fibre – fossil origin

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

Background to requirement O5 Recycled fibres/raw materials: Test for harmful substances

The tests can be done on either the end product or on the recycled fibres/raw materials.

[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

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 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].

The test methods are as stated in Testing Methods Standard 100 by Oeko-Tex (2021).

Background to requirement O6 Synthetic fibre: Bio-based origin

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

[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
[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.
[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.

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]. On the basis of 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 a number of 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.

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 by the use of genetically modified microorganisms

[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 World Wide Fund for Nature, Denmark.
[34] http://www.worldwildlife.org/industries/soy, (27.01.2016).

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.

Background to requirement O7 Polyamide

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.

Dinitrogen monoxide (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.

The N_2O emissions to air during the monomer production, expressed as an annual average, must not exceed 9 g/kg of polyamide 6 fibre produced or 9 g/kg of polyamide 6.6 fibre produced.

[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.

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

Background to requirement O8 Polyester

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].

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[40].

Polyester usually contains antimony in concentrations of 150-350 ppm (mg/kg)[41]. 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 di antimony trioxide (Sb_2O_3) content in finished PET can vary somewhat, the requirement should be set as an average over a period of a number of months or a year.

Background to requirement O9 Polypropylene

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.

Background to requirement O10 Polyurethane

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

Background to requirement O11 Cotton

Cultivation of cotton is linked to serious health and environmental problems caused using pesticides, fertilisers, irrigation water and monocultures[42,43,44]. Pesticides for cotton cultivation accounted for 5.7% of global pesticide sales and 16.1% of insecticide sales in 2014.[45] The environmental impacts of cotton production vary between countries and production systems. Production ranges

[39] Ragaert, K. Mechanical and Chemical Recycling of Solid Plastic Waste, 2017 Waste Management publication.
[40] Chemical Recycling, Making Fiber-to-Fiber Recycling a Reality for Polyester Textiles, GreenBlue 2018 hentet fra https://greenblue.org/work/chemical-recycling/
[41] Miljøstyrelsen, Miljøprojekt nr. 892, 2004, Antimon - forbrug, spredning og risiko.
[42] 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
[43] 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).
[44] Kooistra K, Termorshuizen A, Pyburn R (2006) The sustainability of cotton – consequences for man and the environment. Wageningen University & Research, report no. 223.
[45] 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

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.

Integrated pest management (IPM) and organic cultivation:
Integrated pest management (IPM)[46] and agro-ecological[47] 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 farm workers and use of protective equipment are also important.

In organic farming IPM is required along with other practises that promote soil health and biodiversity, and synthetic pesticides and fertilisers are prohibited[48].

IPM is required by law in some countries, for example in all the EU. Voluntary private certification schemes and national programs promoting IPM also exist. 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.

[46] https://www.fao.org/pest-and-pesticide-management/ipm/principles-and-practices/en/
[47] https://www.fao.org/agroecology/overview/en/
[48] Nordic Swan Ecolabel: Organic farming (accessed 02.09.2022) https://www.nordic-ecolabel.org/nordic-swan-ecolabel/environmental-aspects/sustainable-raw-materials-and-biodiversity/organic-farming/
[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).

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.

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

[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.

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].

Background to requirement O12 Regenerated cellulose fibre: Recycled textile fibre

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 for the production of 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.

Background to requirement O13 Regenerated cellulose fibre: Limitation of tree species

A number of 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.

a) Criteria for tree species found in the list are wood originating from:
b) Tree species listed on CITES Appendices I, II and III.
c) IUCN red list, categorized as critically endangered (CR), endangered (EN) and vulnerable (VU).
d) Regnskogsfondet (Rainforest Foundation Norway) tree list
e) 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,

[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.

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 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 a number of strict requirements regarding certification and traceability.

[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)
[65] https://www.regnskog.no/no/hva-du-kan-gjore/unnga-tropisk-tommer/tropiske-treslag (visited January 2020)

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 a number of 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 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.

In order 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. In order to secure that plantation has not replaced native ecosystems (forest/grasslands) within the last 25 years, tree species has to 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.

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

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.

Background to requirement O14 Regenerated cellulose fibre: Traceability and certified raw materials

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.

Background to requirement O15 Regenerated cellulose fibre: Bleaching with chlorine gas

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.

Background to requirement O16 Regenerated cellulose fibre: Process

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

[72] JRC Technical Reports, Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Textile Products, Nov 2013, page 304: http://ec.europa.eu/environment/ecolabel/documents/140124%20Ecolabel%20Textiles_Technical%20report%20final.pdf

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.

Background to requirement O17 Overview of chemical products

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.

Background to requirement O18 Classification of chemical products

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].

Background to requirement O19 Prohibition of CMR substances

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

[72] JRC Technical Reports, Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Textile Products, Nov 2013, page 304: http://ec.europa.eu/environment/ecolabel/documents/140124%20Ecolabel%20Textiles_Technical%20report%20final.pdf

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

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.

Background to requirement O20 Prohibited substances

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 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.

[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/
[76] https://echa.europa.eu/sv/substances-restricted-under-reach

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 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

[77] Miljøstatus i Norge (2008): Hormonforstyrrende Stoffer.
http://www.miljostatus.no/Tema/Kjemikalier/Noen-farlige-kjemikalier/Hormonforstyrrende-stoffer/#D
(dated 26.02.2009)

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 tetra Bromo bisphenol 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. 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 pentadecene fluoro octanoate) and certain fluoride acids are on the Candidate List due to, for instance, their negative effect on fertility and being

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

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.

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

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

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 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.

[84] Guidance to businesses on phthalates, Danish Environmental Protection Agency 2013.

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.

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

[85] Roadmap to zero https://www.roadmaptozero.com/fileadmin/layout/media/downloads/en/Chlorophenols.pdf accessed 02.08.2019.
[86] https://miljostatus.miljodirektoratet.no/tema/miljogifter/prioriterte-miljogifter/tbt-og-andre-organiske-tinnforbindelser/.

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 Di stearyl 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 (methyl glycine diacetic 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 diethylenetriaminepentaacetic acid (DTPA) is an amino poly carboxylic 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.

Background to requirement O21 Degradability of detergents, softeners, and complexing agents

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.

[87] JRC Technical Reports: Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Textile Products 2013.

Background to requirement O22 Bleaching agents

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.

Background to requirement O23 Chemicals containing silicone

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.

Background to requirement O24 Biocides and antibacterial substances

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 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

[88] The EU Ecolabel's background document, 2007.
[89] Silverläckan, En rapport om silver i sportkläder 2018, Svenskt Vatten
file:///C:/Users/hbb/Downloads/Silverrapport%20Svenskt%20Vatten%2020181022C.pdf

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.

Background to requirement O25 Polymers and their additives in finishes

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 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

Background to requirement O26 Wastewater from wet processes

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 based on 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 40ºC (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.

4.4.6 Polyurethane foam (PU foam)

Background to requirement O27 Blowing agents

Halogenated organic compounds may not be used as blowing agents or auxiliaries for these. Historically, CFC, HCFC and HFC have been used in the production of PU foam, and it is generally known that these substances are harmful to the environment, especially as greenhouse gases and as ozone depleting substances. The requirement prohibits the use of halogenated organic compounds that are used as blowing agents or auxiliaries for these. Many producers of PU foam have replaced CFC and HCFC with carbon dioxide but ensuring that they are not used is still considered relevant.

Background to requirement O28 Polycyclic aromatic hydrocarbons (PAHs)

The PAHs usually originate from two types of additives, which are plasticising and process oils (extender oils) and carbon black, which is found in rubber and plastic products, and which is known to contain PAHs. Plasticising and process oil is a mineral oil product which originates from crude oil (petrogenic PAHs), while carbon black is a product that is produced by incomplete incineration or thermal degradation processes for heavy oils such as coal tar (primarily pyrogenic PAHs). Carbon black is used as a dye, amongst other things. PAHs have been found in expanded polystyrene[91] and PU foam[92] for consumer products, which makes this requirement relevant here.

The eight PAHs in the table are restricted in REACH and must thus not exceed 1 mg/kg of each. Clothes, shoes, and gloves are some of the consumer products covered by this REACH limitation[93]. The criteria requirement goes further than REACH, as it sets a maximum level of 0.5 mg/kg for each PAH.

Background to requirement O29 Additives and treatments

Chlorinated paraffins may be used as flame retardants and as softeners, thus substitution of chlorinated paraffins will depend on the effect to be achieved.

[91] Si-Qi Li, PAHs in polystyrene food contact materials: An unintended consequence, Science of The Total Environment, Volume 609, 31 December 2017, Pages 1126-1131.
[92] Survey and risk assessment of chemical substances in bicycle helmets, The Danish Environmental Protection Agency 2018.
[93] Guideline on the scope of restriction entry 50 of Annex XVII to REACH: Polycyclic aromatic hydrocarbons in articles supplied to the general public, European Chemical Agency 2018.

Organotin compounds: Polyurethane foam (PU) may contain organotin compounds such as dibutyltin (DBT) and tributyltin (TBT) which can, for example, be applied as an antibacterial treatment[94].

Halogenated flame retardants: Halogenated organic compounds such as chlorinated paraffins or brominated compounds can, for example, be used as flame retardants in foam materials and polystyrene balls[95].

See requirement O20.

4.5 Cleaning tools

This section covers requirements for cleaning tools to which the cleaning fabric are to be attached, 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 is present with a total amount of maximum 5% by weight of the cleaning tool is 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.

Background to requirement O30 Material recovery

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.

Background to requirement O31 Aluminium: Recycled content

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[96]. 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

[94] Survey, emissions and health assessment of chemical substances in baby products, Danish Environmental Protection Agency, 2008.
[95] Survey, emissions and health assessment of chemical substances in baby products, Danish Environmental Protection Agency, 2008.
[96] Taxonomy report, technical annex, EU technical expert group on sustainable finance, March 2020.

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%.

Background to requirement O32 Plastic: Information on polymer type and surface treatment

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.

Background to requirement O33 Plastic: Polymer types and plastic composites – Ban

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[97]. 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 O37.

Nordic Ecolabelling here defines plastic composites as plastic mixed with/added to other substances or materials[98], which are insoluble in the plastic[99] 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[100,101]. With this in mind, plastic composites are not permitted, even if the fractions of other materials are as low as 0.5%.

[97] EU Plastics Strategy: https://ec.europa.eu/denmark/news/eu-strategi-plastic_da
[98] Plastindustrien: Komposit-plast | plast.dk
[99] Store Norske Leksikon: plastkompositter – Store norske leksikon (snl.no)
[100] https://plast.dk/wp-content/uploads/2019/12/Designguide-Genbrug-og-genanvendelse-af-plastemballager-til-de-private-forbrugere-online-version.pdf
[101] Dialog med to nordiske plastrecirkuleringsanlæg, 2020.

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[102]. Therefore, calcium carbonate should only be added in quantities so that the density of the plastic does not exceed 0.995 g/cm^3.

Background to requirement O34 Plastic: Marking for recycling sorting

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.

Background to requirement O35 Plastic: Recycled contents

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

Background to requirement O36 Plastic: Chemicals in recycled plastic

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[103], 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.

[102] The Association of Plastics Recyclers | HDPE Design Guidance (plasticsrecycling.org)
[103] Report: Problematiske kemiske stoffer i plast, Danish Environmental Protection Agency 2014 https://mst.dk/service/publikationer/publikationsarkiv/2014/dec/problematiske-kemiske-stoffer-i-plast/

Background to requirement O37 Plastic: Raw materials for bio-based polymers

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 O38 and O39 apply for surface treatment of the cleaning tool, regardless of the materials it consists of. In addition, for surface treatment of metals requirement O40 applies and for surface treatment of plastics requirement O41 applies.

Requirement O42 applies to additives in plastic.

Background to requirement O38 Surface treatment: Antibacterial substances

See background to requirement O24 for more information.

Background to requirement O39 Surface treatment: Nanomaterials

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[104,105,106,107,108,109,110]. 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

[104] 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

[105] 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

[106] 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.

[107] 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

[108] 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

[109] 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

[110] 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

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 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.

Background to requirement O40 Surface treatment of metals: Coating/plating/ galvanizing

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 a number of 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[111]. 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.

Background to requirement O41 Surface treatment of plastic

Surface treatment of plastic can negatively affect the possibilities for recycling of the plastic; therefore, no surface treatment is allowed.

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

Background to requirement O42 Additives in plastic

Please see background in requirement O20.

4.6 Quality and performance requirements

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

Background to requirement O43 Dimensional changes after washing and drying

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.

Background to requirement O44 Colour fastness to washing

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.

Background to requirement O45 Durability

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. The cleaning performance must be tested following a specific number of washes to demonstrate the product's service life (of acceptable function) during a period of use of about one year. According to information received, consumers wash products considerably less often than professional users (50 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 100 washes, and products intended for professional users are to be tested after 300 washes. In the case that it is claimed that the product has a durability of more washes than 100/300, then the product must be tested according to appendix 5 for 100/300 washes and the applicant must hereafter document how the durability of the stated number of washes is reached. A durability of 500 washes for high end professional products are often claimed by manufactures of microfibre cloths and mops. However, in this requirement professional products must be washed 300 times (unless durability of more washes is claimed) because also high quality level of removal of dust and dirt in O46 and if relevant quantities of micro-organisms in O47 must be documented

after washing. In addition, the time and cost used to do the washing must be reasonable for the applicant.

Background to requirement O46 Removal of dust and dirt

If a product is designed for several use methods (wet, damp and/or dry), its performance regarding dust and dirt removal must be documented for all use methods that it is designed for. 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.

Background to requirement O47 Assessment of hygienic conditions (measurement of quantities of micro-organisms)

If a product is designed for several use methods (wet, damp and/or dry), its performance regarding micro-organism reduction must be documented for all use methods that it is designed for. 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 are capable of reducing levels of micro-organisms by a relatively large amount when used without chemicals (up to 99% for cloths). Such cleaning performance can, however, vary depending on the type of surface to be cleaned and the cleaning methods applied (wet, damp, or dry). When cloths for wet 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 wet 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.

Background to requirement O48 Abrasion

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.

Background to requirement O49 Absorption

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 wet or damp cleaning.

Background to requirement O50 Loss of fibre fragments

Loss of fibre fragments from washing of textiles is an area of great focus because this can lead to microplastic contamination of the environment. Recognized standardized test methods just recently have been developed for determining the loss of fibre fragments when washing textiles in household washing machines. However, these methods are not adapted to cleaning textiles. Instead, we use a test method developed by the Weber & Leucht Laboratory. This method is aligned with AATCC TM-212 and EN ISO 4484-1 but is developed specifically for the purpose of testing the release of fibre fragments during the service life of cleaning textiles. The test allows for classification on an index, The MLC-Index®.

4.7 Labelling

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

Background to requirement O51 Labelling

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

The end user shall be informed that the products contain microfibers 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.

The products 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 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.

4.8 Human Rights Due Diligence in the Supply Chain

The requirements in this section are meant to prevent and address adverse impacts across the value chain of licensed products. The requirements are grounded in key international standards on human rights due diligence adopted by the UN and the OECD. These soft law standards are referenced in the draft due diligence obligation in the EU, meant to ensure coherence for companies across existing and proposed EU initiatives on responsible business conduct.

The requirements are also in step with existing practice in the sector, including the risk-based approach to tackle the most salient risks to people. Licensees are given a broad range of approaches to manage sustainability risk, and for the Nordic Ecolabelling to assess compliance, rather than a heavy reliance on contractual assurances and audits/verifications.

Background to requirement O52 Human Rights Due Diligence

The human rights due diligence should be aligned to expectations set out in the UN Guiding Principles on Business and Human Rights[112], and with the Organisation for Economic Co-operation and Development's Guidelines for Multinational Enterprises[113], clarified in plain-language explanations in the OECD Due Diligence Guidance for Responsible Business Conduct[114] to help promote a common understanding on due diligence compliant with that of the UNGPs. See also the OECD's sector-specific guidance[115].

The Guiding Principles were unanimously adopted by the UN Human Rights Council in June 2011. In line with the Guiding Principles, companies have a responsibility to undertake due diligence in their value chains to ensure respect for human rights. The human rights benchmarks are expressed in the International Bill of Human Rights and International Labour Organization Declaration on Fundamental Principles and Rights at Work (which sets out the ILO core conventions). Companies are asked to employ ongoing risk-based due diligence to identify, prevent, and mitigate actual and potential adverse impacts on human rights based on its own activities, and those which may be directly linked to its operations, products, or services by its business relations. The scope of due diligence depends on the nature of the human rights risk and the company's connection to it (see Principle 13).

The licensee should, in good faith, take informed steps to implement due diligence by applying a risk-based approach; the Guiding Principles expect companies to prioritize attention to the likely risk of severe harm (salient risks), to make it manageable. The licensees must be open and responsive to issues that may arise in their supply chains.

The EU Commission's proposal for a Corporate Sustainability Due Diligence Directive (CS3D)[116] references the Guiding Principles and OECD guidance. The CS3D takes a comprehensive approach and ties social aspects in the supply chain with delivering on the EU's Green Deal[117]. The Directive aims to ensure

[112] United Nations Guiding Principles on Business and Human Rights ("UNGPs"), 2011, see https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf
[113] Organisation for Economic Co-operation and Development (OECD)'s 2011 Guidelines for Multinational Enterprises, see https://www.oecd.org/corporate/mne/, revised in 2023.
[114] Organisation for Economic Co-operation and Development (OECD)'s 2018 Due Diligence Guidance for Responsible Business Conduct ("OECD Due Diligence Guidance"), see https://www.oecd.org/investment/due-diligence-guidance-for-responsible-business-conduct.htm
[115] Organisation for Economic Co-operation and Development (OECD)'s Due Diligence Guidance for Responsible Supply Chains in the Garment & Footwear Sector, see https://www.oecd.org/industry/inv/mne/responsible-supply-chains-textile-garment-sector.htm
[116] See https://eur-lex.europa.eu/resource.html?uri=cellar:bc4dcea4-9584-11ec-b4e4-01aa75ed71a1.0001.02/DOC_1&format=PDF
[117] Communication from the Commission to the European Parliament the European Council, the Council, the European Economic and Social Committee and the Committee of the Region "The European Green Deal" (COM/2019/640 final).

coherence for companies and avoid fragmentation of due diligence requirements in the single market resulting from EU member states "acting on their own"[118].

See also requirement O2, which asks for verified value chain mapping in production (dyeing plants and cut-make-trim (CMT) factories) and to connect the product with the actual raw material used.

Background to requirement O53 Preventive safety measure

As of early 2023, the International Accord for Health and Safety in the Textile and Garment Industry is available in Bangladesh and Pakistan[119]. The International Accord began as the Accord on Fire and Building Safety in Bangladesh in 2013.

The Rana Plaza textiles factories building collapse in Bangladesh in 2012, showed the need in this sourcing country for buyers to check they are buying from structurally safe buildings. Structural safety assessments can be extremely expensive and are not generally included in social audits of labour standards, so the Bangladesh Accord on building safety was created as a collaboration to share assessment costs between many buyers and suppliers. In addition, it's leadership by trade unions with buyers allows workers to raise safety issues which can arise when new heavy machinery is added to floors or other safety factors change. A considerable proportion (over 3000) of all textile export factories in Bangladesh are assessed through this programme, and it is free to check on the Accord website that sites are deemed safe by the programme. The Accord is now extended to Pakistan.

Background to requirement O54 Assessment of safety and labour conditions

See appendix 9 and 10 in the criteria.

5 Licence maintenance

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

Background to requirement O55 Control and assessment of suppliers

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

Background O56 Customer complaints

Nordic Ecolabelling requires that your company has implemented a customer complaint handling system. To document your company's customer complaint handling, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for customer complaint handling, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the customer

[118] CS3D, see Explanatory Memorandum p. 3.
[119] See https://internationalaccord.org/

complaint handling is implemented in your company as described. The customer complaints archive will also be checked during the visit.

Background O57 Traceability

Nordic Ecolabelling requires that your company has implemented a traceability system. To document your company's product traceability, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for product traceability, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the product traceability is implemented in your company as described.

6 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.

Requirements generation 3	Requirements 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				x
O29				x
O30	R27	x		
O31	R28		x	
O32	R30		x	
O33	R30		x	
O34	R30		x (minor)	
O35	R32		x (minor)	
O36-O39				x

O40	R29		x (minor)	
O41	R34		x	
O42	R33		x (minor)	
O43-O44	R20-R21	x		
O45				x
O46-O47	R35-R36		x	
O48-O49	R37-R38	x		
O50				x
O51	R41-R42		x (minor)	
O52-O54				x
O55				x
O56-O57	R43-R49		x	