About Nordic Ecolabelling for

Cleaning products

Generation 7 • 11 March 2026 – 31 March 2031

Nordic Ecolabelling

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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:

Denmark

Ecolabelling Denmark

www.svanemaerket.dk

Iceland

Ecolabelling Iceland

www.svanurinn.is

Finland

Ecolabelling Finland

www.joutsenmerkki.fi

Norway

Ecolabelling Norway

www.svanemerket.no

Sweden

Ecolabelling Sweden

www.svanen.se

1 Summary

Cleaning products designed for general and regular cleaning of hard surfaces and textile flooring are eligible for the Nordic Swan Ecolabel. The criteria document applies to cleaning products for indoor and outdoor use by consumers and professionals in the form of concentrated products and ready-to-use (RTU) products including mix-it-yourself RTU products.

Nordic Ecolabelling recognizes a good potential to reduce important environmental impacts of cleaning products by setting requirements for:

- Raw material sourcing, section 5.2 - including requirements for plant materials used for production of chemical raw materials (especially palm oil)
- Ingoing substances, section 5.3 - addressing exposure of chemicals harmful to health
- Ecotoxicity and biodegradability, section 5.4 - addressing impacts to aquatic organisms and ecosystems
- Performance, section 5.5 - to avoid ineffective products that lead to overdosing, a problem that wastes both raw materials and packaging while increasing air and water pollution
- Packaging, section 5.6 - to address plastic and other packaging raw material resource use and recyclability
- License maintenance, section 5.7 - to ensure quality and traceability needed to ensure fulfilment of Nordic Ecolabelling requirements

Changes to the requirements from the previous generation of the criteria include:

- The product group definition clarifies overlaps with other product groups while expanding the product group to include additional product types including outdoor surface cleaners, kitchen equipment cleaners, and dishwasher and laundry machine cleaners
- Supply Chain Policy and Supplier Code of Conduct requirement is added
- The new EUH hazard classes for endocrine disruptors, PBT/vPvB, PMT/vPvM, STOT RE 1, and ozone layer are added to the prohibited classifications for ingoing substances
- The list of excluded substances is expanded with new substances/substance groups, and the definitions for potential or identified endocrine disruptors, microplastics, and nanomaterials/-particles are updated
- The restricted fragrance substances which are subject to declaration now includes the expanded list from the Cosmetics Regulation
- Revised requirements for products containing micro-organisms. Consumer and professional products for numerous uses can contain micro-organisms if provisions for safety are upheld.
- Surfactants are no longer exempted from the long-term environmental effects requirement, M factor has been introduced for substances classified as H410, and the limit values have been adjusted

- CDV and biodegradability limits are stricter, and calculations must be based on the DID-list version 2023 or later
- The performance test for professional products has stricter requirements and revised forms for the user tests compared to the previous generation
- For rigid plastic packaging of PE and PP, the label must be made of the same plastic material as the container, and paper labels are no longer permitted at all

1.1 Changes compared to previous generation

In generation 7, specific requirements for wash polish/wash-and-wax care products have been incorporated into the requirements for all product types and no longer have their own section. This applies to requirements O16-O26 in generation 6 which are now incorporated into requirements O2-O17 in generation 7. Furthermore, the environmental management and regulatory requirements (O30-O36 in generation 6) have been changed to "License maintenance" requirements O23-O24 in generation 7. As a result, the numbering of many of the requirements has changed. Other changes from generation 6 to 7 are listed below.

Table 1 Overview of changes to criteria for cleaning products generation 7 compared to generation 6.

Requirement generation 7	Requirement generation 6	Same require-ment	Change	New require-ment	Comments
O1 Description of the product	O1	X			
O2 Classification of the cleaning product	O5, O16		X		Strengthened: New EUH hazard classes added.
O3 Supply Chain Policy and Code of Conduct				X	Supply Chain Policy and Supplier Code of Conduct requirement for companies >250 employees
	O2 Sustainable raw materials				Removed: no longer required to demonstrate increased use of renewable raw materials
O4 Certified raw materials from oil palms	O3		X		Editorial change: Minor adjustments to required documentation
O5 Classification of ingoing substances	O6, O17		X		Strengthened: New EUH hazard classes, STOT RE1, and ozone hazard classes added
O6 Excluded substances	O7, O18		X		Strengthened: Definitions for endocrine disruptors and nanoparticles updated. New substances added. All isothiazolinones, siloxanes, and phosphorous are excluded.
O7 Microplastics	O7, O18		X	X	Strengthened: Updated with REACH definition and made into its own requirement (previously in O7, O18 Prohibited substances)
O8 Surfactants	O4		X		Strengthened: Refers to DID list 2023 or later
O9 Fragrances	O8, O19		X		Strengthened: Includes expanded list of fragrance allergens from Cosmetics Regulation
O10 Preservatives	O9, O20		X		Strengthened: Changed definition of bioaccumulating
O11 Micro-organisms	O10		X		Strengthened: More product types can contain micro-organisms. Stricter requirements for micro-organism identification (whole gene sequencing) and safety (QPS list). New methods and documentation requirements

O12 Long-term environmental effects	O11, O21		X		Strengthened: Removed exemption for surfactants and included M-factor. Changed product subcategories and raised long-term effects calculation limits for all subcategories except outdoor cleaning products, which was lowered.
O13 Critical dilution volume	O12, O22		X		Strengthened: Changed product subcategories and tightened CDV calculation limits by about 50%. Removed exemption for high molecular weight substances for wash polish/wash-and-wax care products
O14 Aerobic and anaerobic biodegradability	O13, O23		X		Strengthened: Changed product subcategories and tightened aNBO and anNBO calculation limits by about 50%. Removed exemption for high molecular weight substances for wash polish/wash-and-wax care products.
O15 Performance test – laboratory test	O14, O24	X			
O16 Performance test – user test	O15, O25		X		Strengthened: User test must now be conducted by users who are professional cleaning staff
O17 Recycling design of packaging	O26-A		X		Editorial change: Changed wording in exemption for small parts in dispensing systems.
O18 Labels for rigid plastic packaging	O26-B		X		Strengthened: Updated label requirements to improve recyclability of the packaging
O19 Recycling design of pouches	O27		X		Editorial change: Changed wording in exemption for pouch valves.
O20 Cardboard packaging for liquid products				X	New requirement for design for recycling of cardboard packaging for liquid products
O21 Weight-Utility Ratio	O28	X			
O22 Packaging for foam/spray products and concentrated products for refill	O29	X			
O23 Customer complaints				X	
O24 Traceability	O35		X		Editorial changes
	O30 Responsible person and organizations				Removed
	O31 Documentation				Removed
	O32 Quality of the cleaning product				Removed
	O33 Planned changes				Removed
	O34 Unplanned non-conformities				Removed
	O36 Legislation and regulations				Removed

2 Justification of the product group definition

For a description of the product group definition, see “What can carry the Nordic Swan Ecolabel” in the criteria document.

Explanation for product dilution (concentrated products, ready-to-use (RTU) products, and mix-it-yourself RTU products)

Concentrated vs. ready-to-use products

Concentrated cleaning products need to be diluted with water before use on the area or object of cleaning. Concentrates are often diluted with a larger volume of water (5-10 L or more) and result in a product that can be used on a large surface area. Concentrates also include, for example, dishwasher, coffee machine, and laundry machine cleaners that are diluted with water in the machine. Concentrates are typically used during a short duration of a couple days or less. Concentrated products are judged on their performance compared to other concentrated products.

Ready-to-use (RTU) cleaning products are pre-diluted and ready for use directly on the area or object of cleaning. A RTU product's performance is measured against a RTU reference product. RTU products are included in the criteria to address the large market for RTU products, particularly in the consumer market, after considering both advantages and disadvantages in their environmental life cycle.

The primary advantage of RTU is that it can prevent overdosing since the product is pre-diluted in the appropriate concentration for cleaning. Overdosing leads to a higher burden of chemicals released into the environment. Furthermore, overdosing affects all areas of the life cycle since new products are produced and consumed at an unnecessarily high rate.

Environmental disadvantages are the climate impact associated with transporting products with high water content and the relatively large amount of packaging required compared to concentrated products.

Hence, Nordic Ecolabelling restricts RTU products to those intended for use on smaller surfaces (i.e., it must be clear from the text and pictograms submitted in requirement O1 that the product is intended for small surfaces such as tables, sinks, toilets, mirrors). Furthermore, to address the health risks of exposure to aerosols in spray mist, Nordic Ecolabelling sets a requirement O22 to only allow foam/sprays with a foamer mesh or equivalent aerosol-reducing device. These products are referred to as foam/spray products.

Mix-it-yourself RTU products

Mix-it-yourself RTU cleaning products are sold as concentrated refill products that are to be diluted at least 10 times by the user to form the final RTU product. Compared to concentrates, mix-it-yourself RTU products are diluted with a smaller volume of water (often 1 L or less) and result in a product that is then used as an RTU product in terms of application to smaller surface area, ability to store for longer periods, and performance measured against an RTU reference product. The concentrated refill product may e.g. be a vial of concentrated product, tablet, or water-soluble sheet. The product shall be diluted in a reusable bottle in a manner that the person handling the concentrated products does not run the risk of coming into contact with the product. These mix-it-yourself RTU products can provide a more accurate dosage compared to a conventional concentrated product where the customer determines the amount of concentrate that is diluted. The ecotoxicity and

biodegradability calculation requirements (O12, O13, O14) are based on the diluted solution and use the applicable RTU calculation limits.

Explanation for product sales market (consumer vs. professional products)

Nordic Ecolabelling sets different requirements for professional and consumer cleaning products. To determine whether a product is for professional use, consumer use, or both, percent sales to the professional market (estimated based on sales data) and the sales channel should be considered, as shown in Table 2.

Table 2 How to determine which requirement a product must fulfil based on sales market

Percent sales to professional market (estimated)	Sales channel	Needs to comply with requirements for
Over 80%	Wholesalers	Professionals
Between 20% and 80%	Wholesalers and retailers	Consumers and Professionals (whichever is strictest for a given requirement)
Under 20%	Retailers	Consumers

Consumer products are for use by consumers in or around their home and in some workplaces and are primarily sold through retailers.

Products for professional use are marketed for use in professional contexts such as cleaning services, institutions, and within the public sector. Products sold for use in the workplace are thus not automatically considered to be professional products under this definition. The product is not considered to be professional if it is primarily sold through retailers.

Professional kitchen cleaning products covered by 026 Cleaning products criteria are for use in cafés, à la carte restaurants, and other smaller, non-institutional kitchens. Cleaning agents for large-scale food production are included in product group 070 Cleaning agents for use in the food industry.

Products that are marketed to consumers, but that are also sold via wholesalers for professional use exist.

If the product is sold to both consumers and professionals, i.e., professional sales account for between 20 and 80% of sales, it will be considered both a consumer and professional product. Where Nordic Ecolabelling sets different requirements for consumer vs. professional products, the product must meet the stricter requirement. This ensures that both non-professional users and professional users of those products receive the intended benefits and safeguards of the requirements. If there is insufficient information, the product will fall in this category by default.

If there is any confusion about whether a product is for professionals or consumers, Nordic Ecolabelling may require documentation explaining where the product is intended to be sold.

Explanation for the product group subcategories

Concentrated, consumer: Concentrated products that require dilution with water prior to use that are designed for the consumer market. Product formats in this subcategory include concentrated liquids, powders, tablets, capsules, and water-soluble sheets.

This subcategory contains products for hard surfaces in the home, such as floors, walls, ceilings, kitchen work surfaces, grills, tiles, WCs, bathtubs, showers, and interior of kitchen equipment, ovens, dishwashers, and laundry machines. Wash polish/wash-and-wax floor care products are also included. Concentrated products for windows (inside and outside) are included, while RTU products for windows have their own subcategory. Products for use outdoors (other than windows) have their own subcategory.

RTU, consumer: Pre-diluted consumer products that are ready to use without dilution including foam/spray products. This includes products for kitchens, ovens, bathtubs, showers, WCs, and so on, but not for large areas such as floors and walls. RTU products shall be intended for use on smaller surfaces and “spot cleaning”. Please note requirement O22regarding aerosol reducing nozzles. Excluded are RTU window cleaners, which have their own subcategory.

In criteria generation 6, consumer WC cleaners had their own subcategory, but license data showed this differentiation from other RTU products was not needed.

Concentrated, professional: This subcategory includes professional products that require dilution with water prior to use. Product formats in this subcategory include concentrated liquids, powders, tablets, capsules, and water-soluble sheets.

This subcategory contains products for indoor surfaces, such as floors, walls, ceilings, kitchen work surfaces, grills, tiles, WCs, bathtubs, showers, and interior of kitchen equipment, ovens, dishwashers, and laundry machines. Wash polish/wash-and-wax floor care products are also included. Chemical products for cleaning of textile flooring are also included in this sub-category. Concentrated products for windows (inside and outside) are included, while RTU products for windows have their own subcategory. Products for use outdoors (other than windows) have their own subcategory.

RTU, professional: Professional products that are pre-diluted and ready for use including foam/spray products. This category includes products for WCs, kitchens, bathtubs, showers, etc., but not for large areas such as floors and walls. RTU products shall be intended for use on smaller surfaces and “spot cleaning.” Please note requirement O22regarding aerosol reducing nozzles.

Excluded are RTU window cleaners, which have their own subcategory. Foam products for large surfaces, for example, industrial food-production kitchens are included in product group 070 Cleaning agents for use in the food industry.

RTU window cleaners: Consumer and professional window and glass cleaners that are pre-diluted and ready for use straight from the package including foam/spray products. Please note requirement O22 regarding aerosol reducing nozzles.

Outdoor surface cleaners: Consumer and professional cleaners that are for use outdoors. These are typically concentrated products for large surfaces like facades, patios, and terraces. They can also be used to clean, for example, outdoor grills, fireplaces, decking, and roofs. Since these products do not pass through a water treatment facility before entering the environment, strict chemical limits have been set for toxicity and biodegradability.

Specialized outdoor products for graffiti removal and cleaning for solar modules are covered under PG 065 Industrial cleaning and degreasing agents. Car, boat, and other vehicle cleaners are covered under PG 013 Care products for vehicles.

Additional information

Subcategory types from criteria generation 6 that are now merged into other subcategories

For criteria generation 7, an effort was made to simplify the number of subcategories. License data supported combining some subcategories for the purpose of setting limit values.

Wash polish/wash-and-wax care products for floors, combined cleaning and polish improvers, are now included in the concentrate subcategories (consumer or professional). These floor cleaning products are diluted prior to use and contain care products: film-forming components such as polymers, resin and/or wax. (For wash polish products for cars and boats, see "Care products for vehicles 013.")

New product types for criteria generation 7

Please note that the newly included product types in generation 7 for cleaning of the interior of kitchen equipment and laundry machines must fulfil the requirements of the relevant subcategory, e.g., concentrated consumer or concentrated professional. However, Nordic Ecolabelling is aware that these subcategories might not be suited for the new product types. Due to lack of data during the criteria revision, it has not been possible to create new subcategories with separate limit values for these types of products.

Similarly, we also lack data on super-concentrated products (i.e., products significantly more concentrated than standard concentrates) to know how these can be handled in the criteria. We ask any potential applicant to contact Nordic Ecolabelling with more information on these products.

Waters for cleaning

Nordic Ecolabelling has evaluated different types of "waters" for cleaning. These "waters" are typically deionized or demineralized water, or dilute solutions containing very low concentrations of a single ingredient. Nordic Ecolabelling takes a positive stance on using fewer chemical ingredients for cleaning, provided the desired cleaning effect is still achieved. However, these "waters" cannot all be regarded in the same way, as the health and environmental impacts of their ingredients and cleaning efficacy vary significantly. Therefore, they are evaluated from a life cycle perspective as described on the Nordic Swan Ecolabel website,[1] and "waters" containing substances that are excluded in the criteria are not allowed.

Products which cannot be Nordic Swan Ecolabelled as cleaning products

Cleaning wipes were examined to assess whether they should be included in this product group. Wipes are usually made of paper or textiles and moistened with water and various chemicals, depending on the area of use. The most common type of wipes is personal hygiene products such as baby wipes, face wipes and so on, which are included in the

[1] https://www.nordic-swan-ecolabel.org/nordic-ecolabelling/environmental-aspects/chemicals-nano-and-microplastics/waters-for-cleaning/

criteria for the Nordic Swan Ecolabelling of cosmetics to make a difference in an already well-established product type. There are also wipes for cleaning fixed surfaces, and these are known as cleaning wipes. While also a growing market, the cleaning wipe format is still a limited share of the whole Nordic cleaning products market. Since the wipe material cannot be sent for material recovery, Nordic Ecolabelling decided not to expand the product group to include wipes. Nordic Ecolabelling does not wish to promote a product that cannot be recycled, and that pose a risk for being flushed down the toilet, when there are less resource-intensive alternatives. Disposable wet wipes are not compatible with the circular economy in the opinion of Nordic Ecolabelling.

Cleaning products intended for certain specialist cleaning purposes cannot be ecolabelled under these criteria. This includes products intended solely for the purpose of:

- limescale removal
- unblocking blockages, cleaning drains
- restricting or preventing biological growth (algae, mould, bacteria)
- total or partial disinfection
- continuous cleaning, e.g., fragrance block for cleaning WCs
- cleaning products for refrigerated rooms
- floor wax and floor polish without cleaning effect

These products are not included in these criteria, since the criteria are aimed at more general and regular cleaning. In some cases, these products use very corrosive or biocidal ingredients that for safety or environmental reasons are not permitted in this product group. In other cases, they have quite different formulations than cleaning products so they would not pass in this product group.

Products within the scope of the Biocides Regulation 528/2012, including products claiming to be antibacterial, antimicrobial, antiseptic, or disinfecting, cannot also make green claims, according to the regulation, and therefore cannot be Nordic Swan Ecolabelled. Furthermore, Nordic Ecolabelling does not allow products that are marketed with claims about antibacterial, antimicrobial, antiseptic, or disinfectant ingredients. Use of products or ingredients with antibacterial, antimicrobial, antiseptic, or disinfectant properties can contribute to increased bacterial resistance and may also harm beneficial microbial populations.

In the event of dispute, Nordic Ecolabelling will determine whether a product may be ecolabelled under these criteria.

3 Justification for the requirements

3.1 General requirements

Background to requirement O1 Description of the product

A description of the product (e.g., label) and its areas of use is required to assess whether the product falls within the product group definition. Since the criteria for cleaning products cover several product categories and products intended for different usage, it is important for Nordic Ecolabelling to receive product information concerning area of use, dilution, and market (professional/consumer).

Dosing of the cleaning product is an important parameter for preventing over-dosing. Over-dosing has a major impact in the form of unnecessary quantities of chemicals being discharged into the environment. All phases of the life cycle are affected by over-dosing, since it causes unnecessary raw material production, manufacturing and transport.

Under the requirement, users must be given clear instructions about how to use the product. Products that require dilution before use must have a label and/or product data sheet explaining how to dilute the product. Data sheets for professional products must state which dosing equipment is recommended.

Nordic Ecolabelling needs to know the complete formulation, with all ingoing substances and known impurities. This is necessary to check the individual requirements and make the necessary calculations. Foil that is not removed before use of the product, and that is water soluble is considered as part of the formulation/recipe.

The safety data sheets must be updated in line with European legislation, which at the time of writing the criteria means compliance with Appendix II of REACH (Regulation (EC) No 1907/2006 as amended by Regulation (EU) 215/830).

Background to requirement O2 Classification of the cleaning product

Nordic Ecolabelling aims to minimize the health and environmental impact of Nordic Swan Ecolabel products. Therefore, cleaning products with the following classifications cannot be certified: hazardous to the aquatic environment, hazardous to the ozone layer, acutely toxic, causes damage to organs, causes skin corrosion, aspiration toxic, sensitising, carcinogenic, mutagenic, toxic for reproduction, endocrine disruptive, and persistent, bioaccumulative/mobile and toxic.

The updated CLP classifications now include endocrine disruptors, PBT/vPvB and PMT/vPvM substances, covering environmental toxicity, persistence, mobility and bioaccumulation. Including PMT and vPvM substances is essential due to their persistence, mobility and potential impact on water quality. The new rules entered into force 20 April 2023. From this date, the Member States may propose harmonized classification and labelling (CLH) with the new hazard classes and manufacturers, importers, downstream users and distributors may also self-classify their substances and mixtures accordingly.

There are transitional periods following the Delegated Regulation's into force. During these periods classification under the new hazard classes is voluntary. Manufacturers, importers, downstream users and distributors are not yet required to classify their substances or

mixtures according to the new hazard classes. During these periods, the new hazard classes can be applied on a voluntary basis. However, any product classified according to these new hazard classes will be excluded under these criteria.

This is a standard requirement, based on the precautionary principle and is only partially tailored to the specific product group.

The exemption for professional products regarding classification as H332, H312 and/or H302 (Acute Tox. 4) is included for products where the manufacturer can show that the packaging is designed to prevent the user from coming into contact with the product. In this case, a technical description and user instructions showing how the user avoids contact with the product must be present.

A classification as corrosive, such as Skin Corr 1 with H314, is also exempted for professional products and WC products, where the classification is due to pH (cf. CLP Annex I: 3.2.3.1.2). This exemption has been made to allow the ecolabelling of highly concentrated products and products intended for areas of use where extreme pH values are required to achieve good performance. Strongly acidic products, for example, may be needed to clean sanitary installations in the professional market, which usually uses more concentrated products that are then diluted automatically.

For criteria generation 7, an exemption has been removed for wash polish/wash-and-wax care products containing methylisothiazolinone, causing the product to be labelled with the hazard phrase EUH208 ""Contains (name of sensitising substance). May cause an allergic reaction." Since there has been time for manufacturers to change to other less hazardous alternatives, this exemption was removed. Isothiazolinones are no longer allowed in Nordic Ecolabelled cleaning products.

The classification of the cleaning product requirement applies to mix-it-yourself RTU products in concentrated form, since refills are sold as concentrates and so the classification regulation (CLP) relates to the concentrated form. This is because consumers can be exposed to the product in concentrated form when diluting the concentrated product. Therefore, these products are no longer allowed to be labelled with hazard phrase EUH208.

The specific requirements for foam/spray products (i.e., ban of STOT SE 3) only apply to foam/spray products in an in-use solution.

The requirement has been updated since the previous generation to take account of current legislation and refers to the CLP Regulation 1272/2008.

The requirement also relates to the industry's self-classification.

3.2 Raw material sourcing

Background to requirement O3 Supply Chain Policy and Code of Conduct

Supply chain management is the handling of the entire process of turning raw materials into a final product. Supply chain policy reflects the companies' requirements and responsibilities for sourcing raw materials along the whole supply chain. This applies both to renewable raw materials and minerals. The policy must commit the company to respect human rights and the environment and comply with local and international laws and regulations (deforestation

risks (EUDR[2]), environmental, health and safety) along the whole supply chain. The policy must also describe the governance processes in place for Due Diligence especially for assessing biodiversity and deforestation risk in the supply chain.

The licensee must in addition also present its supplier Code of Conduct that defines and describes what is expected and required of suppliers in the supply chain. The supply chain policy and code of conduct must be both public and communicated to the supply chain.

The requirement for supply chain management reflects new EU legislation, e.g., due diligence directive (draft proposal) and new forest deforestation legislation, and how commodity companies work today. However, recognizing that the additional workload can affect small-and-medium enterprises disproportionately, Nordic Ecolabelling license applicants and license holders with fewer than 250 employees are exempt from the requirement in this criteria generation.

Background to requirement O4 Certified raw materials from oil palms

Palm oil plantations are often established at the expense of tropical rainforest and other protected areas. This is one of the biggest threats to biodiversity in Southeast Asia, leading to the loss of valuable species, habitats, ecosystems, and landscapes. Hence, palm oil is part of EU´s Regulation on deforestation-free products.

Palm oil is widely used as an ingredient or feedstock for chemical substances and therefore difficult to exclude in NSE products. Therefore, if palm oil is used in the product the palm oil/palm kernel oil, including by-products or residues, must be RSPO certified.[3] Traceability must be ensured by Mass Balance, Segregated, or Identity Preserved. Book and claim are not accepted as there is no link between the claim for certified palm oil and the product itself.

The manufacturer or supplier of palm oil must present a valid RSPO Supply chain certificate (RSPO SCC certificate). The certificate/RSPO schemes ensures and controls the flow of certified claims throughout the supply chain. The manufacturer of the Nordic Swan Ecolabelled product must at request present invoices/delivery notes/order confirmation that the palm oil purchased is RSPO certified. The type of traceability (Mass Balance, Segregated, or Identity Preserved) must be apparent from the documentation.

In cases where the Manufacturer of the Nordic Swan Ecolabelled product is RSPO Chain of Custody certified, the applicant must at request present a third party-controlled balance sheet showing RSPO certified raw materials being accounted/recorded to the Nordic Swan Ecolabelled product(s). This to ensure that RPSO raw materials (credits) are used in the Nordic Swan Ecolabelled product(s).

3.3 Requirements for ingoing substances

Background to requirement O5 Classification of ingoing substances

Nordic Ecolabelling strives to ensure that the health and environmental impact of the products are as low as possible. The requirements therefore make it clear that ingoing

[2] https://green-forum.ec.europa.eu/nature-and-biodiversity/deforestation-regulation-implementation_en
[3] https://rspo.org/as-an-organisation/our-standards/

substances with the following classifications cannot be used in the Nordic Swan ecolabelled product: hazardous to the ozone layer, causes damage to organs, sensitising, carcinogenic, mutagenic, toxic for reproduction, endocrine disruptors, and persistent, bioaccumulative/mobile and toxic.

The new CLP classifications for endocrine disruptors, PBT/vPvB and PMT/vPvM (environmental toxicity, persistency, mobility and bioaccumulation) are included. The inclusion of PMT and vPvM substances is crucial due to their persistence, mobility and potential impact on water quality. The new rules are in force as of 20 April 2023. From this day on, the Member States can make proposals for harmonized classification and labelling (CLH) with the new hazard classes and manufacturers, importers, downstream users and distributors can self-classify their substances and mixtures accordingly.

There are transitional periods from the entry into force of the Delegated Regulation, during which manufacturers, importers, downstream users and distributors are not yet required to classify their substances or mixtures according to the new hazard classes. During these periods, the new hazard classes can be applied on a voluntary basis. However, if an ingoing substance is classified according to these new hazard classes and used in a product, it will be excluded under these criteria.

This is a standard requirement, that is set by the precautionary principle and adapted to the product group. The requirement is intended to exclude problematic substances that might be added to products in the future, even if they are not necessarily found in products on the market today.

Complexing agents GLDA and MGDA contain small quantities of NTA (CAS 139-13-9, classified as Carc2 H351) as residues from raw material production (as attested in various safety data sheets for the raw materials). Nordic Ecolabelling’s review of licensed products shows that there is a need to use these complexing agents in cleaning products. NTA as an impurity in complexing agents is therefore exempted from the requirement, but subject to the limitation that the concentration of NTA in the raw materials must be below 0.2% by weight of the MGDA/GLDA active content in the raw material (e.g., for raw materials with 30% MGDA active content, maximum 0.2% · 30% = 0.06% NTA is permitted in the raw material), and that the concentration of NTA in the end-product must be below 0.1% by weight.

The substances that are most often classified as sensitising in cleaning products are fragrance substances, preservatives, and enzymes. Nordic Ecolabelling restricts these substances via other requirements: O6 Excluded substances, O9 Fragrances, O10 Preservatives.

Enzymes

Enzymes are exempt from the requirement prohibiting sensitising substances, since it is difficult to find enzymes that are not classified as sensitising and the positive environmental effects of enzymes are substantial. However, only enzymes in liquid form or in the form of granules are permitted to reduce the risk of dust-forming enzymes in the manufacture of cleaning products. The exemption also applies to stabilisers and preservatives in the enzyme raw material. This is because enzymes are proteins and therefore readily biodegradable. Proteases are also unstable due to self-hydrolysis. Preservatives and stabilisers are therefore needed to keep enzymes stable until they are used.

Fragrances
Fragrances have a separate requirement regarding allergenic content. Excluding all allergens from fragrances makes it almost impossible to produce a fragrance. Nordic Ecolabelling has, however, chosen to exclude fragrances from professional foam/spray products. Allergenic fragrances are also more restricted in foam/spray for consumers than in concentrated products, since the exposure described above is different for foam/sprays than for concentrated products. See requirement O9.

Preservatives
Preservatives are needed to ensure the quality and stability of the product. Restrictions on sensitizing preservatives are found in requirements O6 Excluded substances and O10 Preservatives.

Background to requirement O6 Excluded substances

Certain problematic substances and substance groups are difficult to exclude through general chemical requirements. To address this, Nordic Ecolabelling has compiled a list of substances that must not be present as ingoing substances in the ecolabelled cleaning product.

The purpose of this list is to prohibit substances that may not be excluded by other requirements but are associated with environmental and health hazards. Some substances are included for clarity, even if they are already prohibited under other requirements.

This is a standard requirement that is set by the precautionary principle and adapted to the product group. The requirement may exclude some substances that are not necessarily found in cleaning products on the market today, so that we exclude these substances if they are added to cleaning products in the future.

Alkylphenols (AP) (e.g. butylated hydroxy anisole (BHA, CAS No. 25013-16-5), butylated hydroxytoluene (BHT, CAS No. 128-37-0), alkylphenol ethoxylates (APEO) and other alkylphenol derivates (APD))

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 (APDs). Ethoxylated nonylphenol and several other alkylphenols are included in the Candidate List due to endocrine disrupting properties. Nordic Ecolabelling also bans APEO/APD compounds through the biodegradability requirement in O8 Surfactants.

Amphoacetates (EC No. 271-792-5, 271-794-6, 931-291-0, 938-645-3, 942-589-5, 943-154-2, 944-415-3, 946-565-5, 947-998-2)

The group consists of 9 amphoacetates, that are used as surfactants in consumer products like detergents and cosmetic products. Based on the potential for widespread use and available information on potential reproductive toxicity (Repro. 1B), these amphoacetates were identified in need for further regulatory risk management in EU.[4]

Aromatic solvents and carriers, incl. chlorotoluenes, chlorophenols and chlorobenzenes*

[4] ECHA group assessment of Amphoacetate and amphopropionate derivatives of N-hydroxyethylimidazolines: https://echa.europa.eu/documents/10162/bfd90551-19c6-41ab-b608-a00147d7db8a

Aromatic solvents, including substances like benzene, toluene, xylenes, chlorobenzenes, chlorotoluenes, and chlorophenols, are used for their strong solvency but pose serious health and environmental risks. They can cause neurological, reproductive, and organ toxicity, and some are carcinogenic. Many are persistent in the environment, toxic to aquatic life, and contribute to air pollution.

Benzalkonium chloride (CAS No. 8001-54-5)

Benzalkonium chlorides (BACs) is part of a group of chemicals with wide applications due to their antimicrobial properties against bacteria, fungi and viruses. There is a risk that frequent and widespread use of BACs in commercial products can generate selective environments for microbes and contribute to resistance to antibiotics. Furthermore, there is a risk to consumer exposure due to their toxicity and allergenic properties.

Bisphenols and bisphenol derivatives

Several bisphenols with the general bisphenol structure and 'bisphenol derivatives' which have constituents with structural properties common to bisphenols are now prohibited. Based on the potential for widespread use and available information on potential endocrine disruptors, reproductive toxicity and PBT/vPvB properties, 34 substances were identified in need for further regulatory risk management in EU.[5]

Boric acid, borates and perborates

Boric acid, borates and perborates have many uses, such as stain removal, oxidizing and bleaching agents and are often used to produce laundry detergents and can be used in industrial cleaners. They are classified as toxic to reproduction and poses a risk to consumers.

Endocrine disruptors, potential or identified, according to any of the EU member state initiative "Endocrine Disruptor Lists" List I, II, or III

Endocrine disruptors (EDs) are chemicals that alter the functioning of the endocrine (hormone) system and consequently cause adverse health effects. The hormone system regulates many vital processes in living organisms and when normal signalling is disturbed, adverse effects can result including diseases and effects on reproduction and development.

The term potential EDs is used for chemicals with properties that make them suspected to be EDs. Substances listed under List II are excluded because they are under evaluation in an EU legislative process due to explicit concerns about possible endocrine-disrupting properties. Excluding them limits exposure while the evaluation is ongoing.

Substances moved to “Substances no longer on list” and not present on Lists I-III, are not excluded, except for those on sublist II where concern remains. Nordic Ecolabelling will assess these on a case-by-case basis.

Ethylenediamine tetraacetate (EDTA, CAS No. 60-00-4) and its salts and Diethylenetriamine pentaacetate (DTPA, CAS No. 67-43-6) and its salts

Ethylenediaminetetraacetic acid (EDTA), diethylenetriamine pentaacetate (DTPA) and their salts are not readily degradable. Furthermore, DTPA is classified toxic for reproduction and may potentially pose a risk to consumers. For EDTA, the EU’s risk assessment states that

[5] Assessment of regulatory needs: Bisphenols. ECHA – 16 December 2021: Section 2.1: Bisphenols for which further EU RRM is proposed https://echa.europa.eu/documents/10162/5e60f2fe-12d0-7f6b-5868-f199cfd7f984

under the conditions at municipal water treatment plants EDTA is either not broken down or only breaks down to a slight degree. To-date in Europe, EDTA has been replaced in virtually all consumer products by readily biodegradable alternatives such as MGDA (methylglycine diacetic acid) and GLDA (glutamic acid diacetic acid).

Halogenated organic compounds

Halogenated organic compounds, including short-chain chlorinated paraffins (C10-C13), medium-chain chlorinated paraffins (C14-C17), chlorophenols and dimethyl fumarate derivates, is a large group of substances that are harmful to both the environment and human health. They are often carcinogenic, highly toxic to aquatic organisms and very persistent to degradation.

Isothiazolinones (e.g. methylisothiazolinone (MIT), CAS No. 2682-20-4, metylchloroisothiazolinone (CMIT), C(M)IT/MIT (3:1), CAS No. 55965-84-9, CAS No. 26172-55-4, benzisothiazolinone (BIT), CAS No. 2634-33-5, octylisothiazolinone (OIT), CAS No. 26530-20-1 and dichlorooctylisothiazolinone (DCOIT), CAS No. 64359-81-5)

MIT and CMIT have caused widespread outbreaks of allergy contact dermatitis worldwide. In Europe, allergy rates to MIT/CMIT peaked in 2013-2014, affecting over 7% of individuals who underwent patch testing, while in North America prevalence exceeded 10% by 2017-201810. Other isothiazolinones could pose similar risks if used extensively. These substances are potent skin sensitizers, and for some, even trace concentrations in the ppm range can trigger allergic reactions. Excluding the entire group prevents regrettable substitution and reduces sensitization risk.*Linear alkylbenzene sulphonates (LAS)*

LAS is an anionic surfactant. In parts of Europe where LAS is commonly used, LAS is found in significant concentrations in wastewater and sewage sludge. SCHEER (2020)[6] reports "negligible anaerobic degradation in freshwater and degradation only under certain conditions in marine waters may lead to accumulation of LAS and thus may present an issue of relevant environmental concern." Hazardous property classification for LAS reported to ECHA are Aquatic Chronic 3, Acute Tox 4, Skin irrit. 2, and Eye Dam. 1. To avoid impacting soil and aquatic environments, including estuarine and coastal environments, as a result of wastewater release and sludge application on fields, LAS remains excluded from use. . Nordic Ecolabelling also bans LAS through the anaerobic biodegradability requirement in O8 Surfactants.

Methyldibromo glutaronitrile (MG, CAS No. 35691-65-7)

Methyldibromo glutaronitrile (MDBGN) has applications within cosmetics and industrial products and is a bromine-containing preservative. MDBGN has been shown to be a sensitizer and cause for allergic contact dermatitis and is therefore banned.

Nanomaterials/-particles

Nanomaterials[7] are a diverse group of materials under the size of 100 nm. For household and professional chemical products, examples of nanomaterials/nanoparticles can include ZnO, TiO_2, SiO_2, and Ag. Due to their small size and large surface area nanoparticles are often more reactive and may have other properties compared to larger particles of the same

[6] https://health.ec.europa.eu/latest-updates/scheer-final-opinion-potential-anaerobic-biodegradability-marine-and-freshwater-linear-alkylbenzene-2020-06-22_en

[7] Nordic Swan Ecolabel webtext: https://www.nordic-swan-ecolabel.org/nordic-ecolabelling/environmental-aspects/chemicals-nano-and-microplastics/nanomaterials/

material. Further, different sizes, shapes, surface modifications and coatings can also change their physical and chemical properties. Nanoparticles 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.

There is concern among public authorities, scientists, environmental organisations, and others about the insufficient knowledge regarding the potential detrimental effects on health and the environment.[8],[9],[10] Nordic Ecolabelling take these concerns seriously and apply the precautionary principle to exclude potentially hazardous nanomaterials from products.

Nanotechnology, which also includes nanoparticles, is used in many product areas, including those for which Nordic Ecolabelling has criteria. The greatest cause for concern is the use of nanoparticles, which can be released and thereby affect health and the environment. There is concern among public authorities, environmental organisations and others about the lack of knowledge regarding the potential detrimental effects on health and the environment.

Nitro musks and polycyclic musk compounds

Nitro musks and polycyclic musk generally have undesirable properties regarding both health and the environment. Some such compounds are already excluded from use via the requirement concerning CMR substances.

NTA (nitrilo triacetic acid), CAS No. 139-13-9, and its salts

NTA is a synthetic complexing agent and does not naturally occur in the environment. Itis present in the environment as a result of its release in sewage from processing. NTA is considered to be persistent and is suspected carcinogenic. Complexing agents that replace NTA (GLDA and MGDA) contain small quantities of NTA as residues from raw material production. To encourage a transition to MGDA and GLDA, these raw materials may contain NTA impurities in concentrations of less than 0.2% by weight of the MGDA/GLDA active content (e.g., for raw materials with 30% MGDA active content, maximum 0.2% · 30% = 0.06% NTA is permitted in the raw material), if the concentration of NTA in the cleaning product is below 0.1% by weight.

Organic chlorine compounds, hypochlorite and hypochlorous acid

Organic chlorine compounds, hypochlorites and hypochlorous acid are sometimes used as disinfecting and antibacterial substances and as bleaching agents. Organic chlorine compounds can be, or lead to the formation of, toxic and bioaccumulative substances that are difficult to break down. Chlorine-based bleaching agents generally have undesirable health and environmental properties. Hypochlorous acid is not classified, and hypochlorites have the classification Acute toxicity (H400) and thus, they are not covered by the general requirement concerning environmentally hazardous substances. However, both pose an

[8] 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

[9] Parliamentary Assembly of the Council of Europe (2013) Nanotechnology: balancing benefits and risks to public health and the environment. http://assembly.coe.int/CommitteeDocs/2013/Asocdocinf03_2013.pdf

[10] 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

environmental risk due to the possibility of organic chlorine compounds forming. Mixing these ingredients with an acid (e.g., acidic cleaning products) leads to formation of toxic chlorine vapour, which is an additional concern due to the ingredients' use in consumer cleaning products.[11]

PBT and vPvB substances in accordance with REACH Annex XIII, including those under ECHA PBT assessment https://echa.europa.eu/da/pbt

PBT and vPvB are abbreviations for substances that are persistent, bioaccumulative and toxic, and very persistent and very bioaccumulative, respectively, in accordance with REACH Annex XIII. This means that they are not biodegradable and that they accumulate in living organisms. Based on these adverse characteristics they pose a threat to the environment and human health. They are prohibited in all Nordic Swan Ecolabel products.

Nordic Ecolabelling excludes substances under ECHA PBT assessment since these substances are suspected of PBT properties. Therefore, we use the precautionary principle in excluding them to limit their release into the environment while they are under assessment.

Per- and polyfluoroalkyl substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS) are used in many types of products due to their water and dirt repellent properties. These compounds constitute a group of substances that have highly problematic intrinsic hazardous properties. They are extremely persistent and accumulate in the body. They are spread all over the globe, from the large oceans to the Arctic, and are found in e.g. wild birds and fish and their eggs. Also, shorter chain compounds (2–6 carbon atoms) have been discovered in nature. The substances in this group are suspected to be endocrine disruptors, carcinogenic, and to have a negative impact on the human immune system.

Phosphate, phosphonate, phosphonic acid and phosphoric acid

Plants, animals, and people all depend on phosphorus to grow. Phosphorus (a constituent element of phosphate, phosphonate, phosphonic acid and phosphoric acid) is, amongst other things, an essential ingredient in artificial fertilizer, which in turn is fundamental in making it possible to feed over 8 billion people on the planet. Phosphorus is a non-renewable resource, facing ever-increasing demand, that can only be extracted from phosphorite, and this is only found in a few countries, several of which have unstable regimes. Since there are alternatives available, Nordic Ecolabelling prohibit the use of phosphate, phosphonate, phosphonic acid and phosphoric acid.

There is no longer any exemption for wash polish/wax-and-wash products since it was no longer deemed necessary.

[11] LOUS, 2009: List of adverse substances 2009. Information from the Danish Environmental Protection Agency no. 3 2010 http://www2.mst.dk/udgiv/publikationer/2010/978-87-92617-15-6/pdf/978-87-92617- 16-3.pdf

Phthalates (Esters of 1,2-benzenedicarboxylic acid (orthophthalic acid, CAS No. 88-99-3))

Phthalates are defined as esters of orthophthalic acid. Orthophthalic acid, also called 1,2-benzenedicarboxylic acid, has CAS No. 88-99-3.

Some 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, many other phthalates can pose a threat to the environment and human health and there is a ban on this group of substances.

Quaternary ammonium compounds that are not aerobically biodegradable such as DTDMAC (CAS No. 68783-78-8), DSDMAC (CAS No. 107-64-7), DHTDMAC (CAS No. 61789-80-8) and DADMAC (CAS No. 7398-69-8)

Quaternary ammonium compounds (QACs) are usually surface-active agents where some of them precipitate or denature proteins and destroy micro-organisms. QACs are toxic to many aquatic organisms including fish, daphnids, algae, rotifer and microorganisms employed in wastewater treatment systems.

Siloxanes

Commonly used siloxanes are the cyclic siloxanes cyclotetrasiloxane (D4), cyclopentasiloxane (D5) and cyclohexasiloxane (D6) and the linear polydimethylsiloxane (PDMS) also known as dimethicone. The cyclic siloxanes D4, D5 and D6 are toxic to human health and the environment having PBT and/or vPvB properties, whereas dimethicone is not considered toxic or bioaccumulative. However, there is a concern that over time, dimethicone will slowly degrade into smaller units exerting the same properties as the cyclic siloxanes. Therefore, the use of both cyclic and linear siloxanes is prohibited.

Silver, colloidal silver and nanosilver

Silver is antibacterial agent used in various consumer products, typically in nano form, where it has a greater effect per total amount of silver. Silver is hazardous to health with since it is classified as reprotoxic and under assessment for endocrine disruptive properties. In addition, silver is extremely hazardous to the environment, classified H400 and H410 with an M factor of 10-1000 depending on particle size.

Substances on the REACH Candidate list of SVHC

The Candidate List identifies substances of very high concern 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, bioaccumulative and toxic) and vPvB (very persistent and very bioaccumulative) 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.

Volatile organic compounds (VOC)

Volatile organic compounds are undesirable, since they are typically harmful to health, often non-readily biodegradable in an aquatic environment and can have negative effects on the ozone layer.

VOCs (Volatile organic compounds) are defined under 1999/13/EC as substances that at 20°C have a vapour pressure > 0.010 kPa.

Nordic Ecolabelling exempts acetic acid, isopropanol, ethanol (including denaturing agents), and fragrances from this requirement. Occupational hygiene limits have been compared for ethanol and isopropanol compared to other solvents. The limits between different VOCs are large. The short time limit for ethanol (mg/m3) is for example 50 times higher than for formaldehyde. To reach the limit for acetic acid, ethanol, and isopropanol several bottles of cleaners would be needed to be used in a room during a workday.

Fragrances are exempt from exclusion of VOC since fragrances are restricted in other requirements.

Background to requirement O7 Microplastics

Microplastics[12] are very small fragments of plastic material. They can be harmful to health and the environment due to their size, surface properties, resistance to degradation and because they can carry harmful chemicals. By excluding microplastics ‘added to the product during manufacturing’, Nordic Ecolabelling also prohibits microplastics that are claimed to transform within the final product to no longer be defined as microplastics.

Microplastic pollution comes from various sources including pellets, paint, tires, textiles, personal care products, and various plastic items. In cleaning agents, microplastics can be added to formulas, for example, as granulates for scouring or as film-forming polymers. Microplastic pollution is found all over the world, at sea, in freshwater, sediments, sludge from wastewater treatment plants, and agricultural soil. Microplastics are detected in various aquatic organisms across the food chain, from zooplankton to vertebrates, and in human tissues and organs such as blood and placenta. The Nordic Swan Ecolabel uses the precautionary principle and strives to limit the use and release of microplastics wherever possible.

Background to requirement O8 Surfactants

Surfactants are widely used in cleaning products and constitute a large proportion of the ingredients in such products. As cleaners are also used in places that lack connection to waste water treatment and go straight into nature it is relevant to set requirements on biodegradability of surfactants.

Compounds that accumulate in the environment can pose a risk both now and in the future if they are acutely toxic. Knowledge of the long-term effects of non-readily biodegradable substances is often in short supply. Rapid biodegradability under oxygen-rich (aerobic) and oxygen-poor (anaerobic) conditions is therefore of major environmental importance.

[12] https://www.nordic-swan-ecolabel.org/nordic-ecolabelling/environmental-aspects/chemicals-nano-and-microplastics/microplastics/

Surfactants are essential in this context, since they are a group of organic substances that appear in large quantities, and since many surfactants are toxic to aquatic organisms.

The EU Detergent Regulation (EC) No 648/2004 and 2026/405 prescribes that surfactants must be aerobically biodegradable, but there are opportunities for exemptions from the regulation for products for professional use. Since the possibility exists, we believe it is appropriate to retain the requirement of aerobic biodegradability of surfactants. Nordic Ecolabelling therefore requires surfactants (irrespective of function) to be biodegradable in both aerobic and anaerobic conditions for this product group.

Examples of surfactants that are not sufficiently biodegradable to clear this requirement include linear alkylbenzene sulphonate (LAS) and alkylphenol ethoxylates (APEO)/ alkylphenol derivatives (APD).

LAS is toxic to aquatic organisms and not anaerobically biodegradable. Therefore, LAS is excluded from use as a surfactant. LAS is also excluded in requirement O6.

APEO and/or APD are a group of non-readily biodegradable surfactants that are proven endocrine disruptors. Legislation has prompted these substances to be phased in most products. They are excluded in this requirement and requirement O6.

Background to requirement O9 Fragrances

Fragrances are a group of constituent substances that do not generally have a cleaning effect in the product, and at the same time they contain substances with negative health aspects, particularly allergens, as well as negative environmental effects, since they are usually not readily biodegradable and they tend to be classified as hazardous to the environment.

However, fragranced cleaning products hold a substantial market share. Nordic Ecolabelling therefore believes that a total ban on fragrances would make Nordic Swan Ecolabelled cleaning products considerably less widespread in the market. In addition to this requirement, requirements concerning environmentally hazardous substances, non-degradable substances and CDV are considered to limit the concentration of fragrances in products and encourage fragrances with a better environmental profile.

International Fragrance Association (IFRA) represents the fragrance industry. The association conducts safety assessments of fragrance substances and provide public standards/guidelines for the use of these. The requirement for compliance with IFRA's guidelines[13] ensures that the manufacture, handling, and use of fragrances in the products meets specific standards in terms of prohibited substances, restricted use, and purity. IFRA's guidelines support the industry in offering products that are safe for consumers and for the environment. The guidelines apply to the manufacture and handling of all fragrance materials for all applications and contain the complete IFRA standards.

In 2023, the Cosmetic Regulation added 56 fragrance substances that must be declared on the packaging of cosmetic products, leading to a total of 80 substances that are subjected to declaration[14]. These substances are adopted from the EU Scientific Committee on Consumer Safety (SCCS) opinion on fragrance allergens in cosmetic products from June

[13] Guidance for the use of IFRA Standards, The International Fragrance Association, 2023
[14] Regulation (EC) No 1223/2009, 2009.

2012[15]. SCCS refrains from recommending maximum limits for the content of the fragrance substances in cosmetic products but however states that the general limit of 100 ppm is tolerated by most consumers and wishes to guard against the development of new allergy sufferers both within generally tolerant and sensitive people. This limit is therefore also set in the requirement for fragrance allergens in cleaning products.

Nordic Ecolabelling do not distinguish between fragrance substances that are subject to declaration and fragrance substances that meet the classification H317 (may cause sensitisation by skin contact) or H334 (may cause allergy or asthma symptoms or breathing difficulties if inhaled), therefore the requirement includes all these substances.

SCCS recommends that chloroatranol, atranol, and HICC are not included in cosmetic products. Nordic Ecolabelling therefore consider it relevant to also prohibit their presence in cleaning products. Chloroatranol and atranol are the main components of oak moss extract (Evernia prunastri, CAS No. 90028-68-5) and tree moss extract (Evernia furfuracea, CAS No. 90028-67-4).

Nordic Ecolabelling finds that there is a strong justification for excluding fragrances from professional foam/spray products since cleaning personnel can be exposed frequently to the substances in the foam/spray products. Professional cleaning personnel are usually not able to choose whether the product contains fragrance and are likely to be exposed to fragrances involuntarily. The exposure can be direct contact with the skin or in the form of foam/sprays that create an aerosol during use.

Even for consumers, Nordic Ecolabelling sets stricter requirements for products sold in foam/spray bottles, since when using a foam/spray product, there is a greater risk of breathing in allergenic substances. Although respiratory aerosols are reduced using foam nozzles, Nordic Ecolabelling has chosen to use precautionary principle when setting the limit. See also requirement O22 regarding foam/spray nozzles.

The Nordic Ecolabel prohibits fragrances in wash polish/wax and wash care products. This product type is for large floor surfaces where it can lead to unwanted exposure of the cleaning staff and building occupants, which Nordic Ecolabelling wants to limit.

Background to requirement O10 Preservatives

Preservatives are added to liquid products to prevent bacterial growth in the products. Cleaning products usually need to be preserved and do not have self-preserving properties to the same extent as liquid laundry detergents, for example, so there is a need to add preservatives to cleaning products. Nevertheless, since preservatives are generally toxic to aquatic organisms and can cause hypersensitivity and allergies, Nordic Ecolabelling wishes to limit preservatives via a requirement that they must not be bioaccumulative and that the levels must be optimised. Sensitising preservatives are also restricted.

a) Preservatives may be used in the products and in constituent substances only if they are not bioaccumulative. Bioaccumulative substances collect in the fatty tissue of living organisms and can cause long-lasting damage to the environment.

[15] SCCS (Scientific Committee on Consumer Safety), opinion on fragrance allergens in cosmetic products, 26-27 June 2012

Unless otherwise proven, substances are bioaccumulative if logKow ≥ 3.0 under the OECD's guidelines 107 or 117, or equivalent. Such a substance may be tested on fish in line with the OECD's testing instructions 305 A–E. If the substance has a biological concentration factor (BCF) ≥ 100 the substance is bioaccumulative, and if the BCF < 100 the substance is considered not to be bioaccumulative. If there is a measured BCF value, the highest measured BCF is always the determining factor in the assessment of a substance's bioaccumulative potential.

The requirement ensures that licence holders do not begin using undesirable preservatives that can enter the ecosystem.

b) Since allergies to preservatives have risen in recent years[16] and Nordic Ecolabelling does not want to contribute towards unnecessary exposure, Nordic Ecolabelling has also chosen to restrict other sensitising preservatives, alongside the ban on isothiazolinones, see O6.

In cases where Nordic Ecolabelling has chosen to allow sensitising preservatives, they are permitted in quantities that do not trigger the labelling of the cleaning product with the warning "Contains xxx, may cause an allergic reaction" (see requirement O2). A limit of 100 ppm has also been set.

Background to requirement O11 Micro-organisms

Some manufacturers make cleaning products that contain living micro-organisms as active ingredients. In the Regulation on detergents and surfactants 2026/405, the EU writes:

"Micro-organisms have their own biology and response to the environment. Due to their ability to proliferate, there is a clear difference between conventional and microbial detergents. Therefore, the inherent hazards and arising risks are not necessarily of the same nature as those presented by chemicals, especially in relation to the capacity of micro-organisms to survive and multiply in different environments and to produce a range of different metabolites and toxins of potential toxicological significance."[17]

While Nordic Ecolabelling writes this criteria version 7, micro-organisms in cleaning products are not subject to regulation under the EU Detergents Regulation (EC) No 648/2004. However, in March 2026, harmonised rules governing the safety of micro-organisms in detergents as well as relevant test methods for economic operators to demonstrate compliance with those rules were published in the revised Regulation on Detergents and Surfactants 2026/405,[18] which applies from 23 September 2029.

Nordic Ecolabelling updated the micro-organism requirement in line with (or stricter than) the revised Detergent Regulation 2026/405 and EU Ecolabel's proposed detergent criteria.[19] This includes the identification and characterisation of micro-organisms using whole genome sequencing, the addition of tests for additional pathogenic micro-organisms, and a safety

[16] (Svedman, ym., 2012), (SCCS, 2013)
[17] EU (2026). Regulation (EU) 2026/405 of the European Parliament and of the Council of 11 February 2026 on detergents and surfactants, and repealing Regulation (EC) No 648/2004. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202600405
[18] EU (2026). Regulation (EU) 2026/405 of the European Parliament and of the Council of 11 February 2026 on detergents and surfactants, and repealing Regulation (EC) No 648/2004. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L_202600405
[19] JRC (2025-11-11). EU Ecolabel 2023 - 2026 revision, Draft Annex VI Hard surface cleaning products for EUEB https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/411/documents

and risk assessment. Some of these requirements will be redundant after the Detergent Regulation 2026/405 goes into effect but will help establish good guidelines and routines for safety in the meantime.

The function of micro-organisms in cleaning products is to decompose organic material on the surface that is being cleaned. For example, this could be fats and proteins on a floor surface. According to some manufacturers, the primary advantage of products containing micro-organisms is that the surface can remain clean longer and can reduce bad odours. The long-term effect of microorganisms can reduce the need for heavy-duty/strong cleaning products, which in the long-term can reduce the use of cleaning chemicals and perfumes.[20]

However, some micro-organisms added to microbial containing products may pose a risk to humans, animals and the environment, via hazards such as infection, intoxication, irritation and/or sensitization.[21]

Nordic Ecolabelling acknowledges the advances of cleaning products with micro-organisms to be efficient in some areas of cleaning. However, due to knowledge gaps regarding the environmental and health risks of micro-organisms in cleaning products,[22] Nordic Ecolabelling applies the precautionary approach to potential risks and goes further than the EU Detergent regulation 2026/405 to ensure safety. Nordic Ecolabelling includes specific requirements for micro-organism-containing products, to establish the micro-organisms' identity and safety at the strain level.

NSE's revised micro-organism requirement requires that micro-organisms intentionally added to cleaning products must belong to both Risk Group 1 and the QPS list:

- Risk Group I as defined by Directive 2000/54/EC – biological agents at work.[23] A group 1 biological agent means one that is unlikely to cause human disease.
- The Qualified Presumption of Safety (QPS) list issued by the European Food Safety Authority (EFSA).[24] About QPS list: EFSA assesses the safety of microorganisms in the applications it receives for market authorisation of feed additives, food additives, and plant protection products. QPS status is the result of a pre-assessment that covers safety concerns for humans, animals, and the

[20] communication with Innu Science and Novozymes

[21] JRC (2025-03-05). Revision of EU Ecolabel criteria for detergent products, Technical Report v. 2.0 (draft). https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/411/documents

[22] VKM, Madslien, et al (2019). Current knowledge of the health and environmental risks of microbialbased cleaning products. Scientific opinion of the Panel on Microbial Ecology of the Norwegian Scientific Committee for Food and Environment. VKM report 2019:09 https://vkm.no/english/riskassessments/allpublications/healthandenvironmentalassessmentofmicrobialbasedcleaningproducts.4.1aaadf0516963f003a25dde5.html

[23] Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC) (OJ L 262, 17.10.2000, p. 21). https://eur-lex.europa.eu/eli/dir/2000/54

[24] EFSA BIOHAZ Panel, Allende, A., Alvarez-Ordonez, A., Bover-Cid, S., Chemaly, M., De Cesare, A., Nauta, M., Peixe, L., Ru, G., Skandamis, P., Suffredini, E., Cocconcelli, P. S., Fernández Escámez, P. S., Maradona, M. P., Querol, A., Sijtsma, L., Suarez, J. E., Sundh, I., Barizzone, F., … Ottoson, J. (2025). Updated list of QPS-recommended microorganisms for safety risk assessments carried out by EFSA [Data set]. Zenodo. https://doi.org/10.5281/zenodo.15827398

environment. During this process, experts assess the taxonomic identity of the microorganism, the related body of knowledge, and potential safety concerns.

Shelf life

By performing a stability test the producer will show that the reduction of micro-organisms over time is low, to ensure that the products perform well after storage before and after reaching the final users.

Risk Assessment

The risk assessment is a tool to help identify potential risks and safety measures for specific types of products and usage.

Performance

One of the claimed advantages of products containing micro-organisms is that they can offer a prolonged cleaning effect. To ensure that Nordic Swan Ecolabelled products offer good cleaning performance, products containing micro-organisms must comply with requirement O15 or O16 (as all other cleaning products) and, in addition, demonstrate that the product has a prolonged cleaning effect by breaking down protein, starch, and fat/vegetable oil continuously under approximately a one week period (or the period claimed by the manufacturer) through these laboratory tests:

Protein - degradation of proteins shown as degradation on standard casein agar medium or through other scientifically acknowledged medium displaying protein degradation.

Starch - degradation of starch shown as degradation on standard starch agar or through other scientifically acknowledged medium displaying starch degradation.

Fat and/or vegetable oil: degradation shown as degradation on “Spirit Blue”-agar medium or through other scientifically acknowledged medium.

Information on data sheet/label

It must be clearly stated on the product's label and/or data sheet that the product contains micro-organisms and all relevant information from the risk assessment about how to safely use the product.

3.4 Ecotoxicity and biodegradability

Background to requirement O12 Long-term environmental effects

A Nordic Swan Ecolabelled cleaning product must never be classified as environmentally hazardous, see requirement O2 Classification of the product. Substances that are classified as environmentally hazardous may be present in cleaning products in limited quantities. Substances that are toxic to the environment and are also not readily biodegradable or substances that are chronically toxic (H410, H411 and H412) constitute a potential problem for the aquatic environment. Limitation of these adverse characteristics will reduce the risk of negative environmental impacts.

The environmental properties of cleaning products are important, because cleaning products are discharged via the treatment plant into the recipient watercourse. Consequently, a requirement has been set concerning the maximum content of environmentally hazardous

substances in a product. By weighting the parameters, substances classified as H410 are subject to the greatest limitation. The weighting in the formula is connected to classification limits for environmentally hazardous substances.

From 1 December 2012 the CLP Regulation changed the criteria used as its basis for classification as environmentally hazardous. This meant that many surfactants which were not previously classified as environmentally hazardous now needed to be, and they were therefore at that time exempted from the requirement, as surfactants have an important irreplaceable function in cleaning products. To promote usage of less environmentally hazardous surfactants, surfactants are no longer exempted in this criteria version. The multiplying factor M for H410 classifications is included in the calculation. To accommodate for these changes, significantly higher limit values for all subcategories are introduced, except outdoor products where substances with H410, H411, and H412 are banned. If data is missing for a substance, it is assessed according to a worst-case scenario with H410 and M factor of 10, since M factors above 10 are rare.

Background to requirement O13 Critical dilution volume (CDV)

The critical dilution volume (CDV) is a theoretical value which considers the toxicity and aquatic degradability of each substance. Products with a lower CDV will have less potential adverse impact on the recipient watercourse.

CDV is calculated for all ingoing substances included in the cleaning product. Chronic data must be used because it better describes the environmental impact. When chronic data is unavailable, acute data can be used combined with higher safety factors.

Micro-organisms

Micro-organisms are living organisms that function more as “producers” of enzymes than as substances that are broken down when the product is used, so it is not relevant to include them in the CDV calculation. Furthermore, it is very difficult to place microorganisms in the CDV calculation, as they are not declared in a percentage concentration in the same way as other raw materials. Instead, their concentration is given in the form of number of “colony forming units” per millilitre. Micro-organisms are also not included on the DID list.

Micro-organisms produce enzymes that remain on the cleaned surface, but the quantity is judged to be very small. The enzymes produced are mainly lipase, protease, amylase and esterase. The effect on the CDV of these enzymes is expected to be small in comparison with, for example, the effects of surfactants and fragrances in cleaning products. According to one manufacturer, they are present in such small amounts that they cannot be measured using the typical enzyme measuring tools, either on the surface or in the air. Since the levels are so small, excluding them from the CDV calculation is not considered to pose any major risk.

Background to requirement O14 Content of substances which are not aerobically and/or anaerobically biodegradable

A general requirement on the permitted amount of non-readily (aerobically) degradable and non-anaerobically degradable organic substances reduce the use of non-biodegradable substances in cleaning products to a minimal level. This requirement gives ecolabelled cleaning products a good degradability profile and reduces the potential accumulation of non-readily degradable substances in waste sludge and the environment.

In some places sludge is used as a soil improver. It is important that the sludge contains no or minimal levels of non-readily degradable substances, which can run-off into aquatic environments.

Substances that are commonly used in cleaning products and that are not readily degradable (aNBO) include: fragrances, phosphonates, EDTA, iminodisuccinate, certain thickeners and colourants. Phosphonates and EDTA are also excluded under the requirement O6 excluded substances.

Organic substances with poor degradability remain in the environment for longer, which increases the risk of them damaging nature. Rapid biodegradability in both aerobic and anaerobic conditions is therefore desirable.

3.5 Performance

Background to requirement O15 and O16 Performance test - laboratory and user test

Performance tests are primarily a quality requirement to ensure that a good cleaning result is achieved at the stated dose of the ecolabelled product. A product that shows good performance at the dose stated on the label reduces the risk of over-dosing, since the user can see that the product is effective and has no need to use more than is recommended.

Under the requirement, a product must be at least as good as or better than the product with which it is being compared (the reference product). For professional products, the applicant can choose between conducting a laboratory test (O15) or a user test (O16), with the exception of cleaning products for machines and kitchen equipment, which must be tested in accordance with the laboratory test.

The laboratory test is the only option for consumer products (O15). The reason for this is partly that Nordic Ecolabelling has not seen any great demand to be able to conduct user tests on consumer products, and partly that professional users have more experience of using products since they do so every day, and so a test performed by a professional user yields more information than one performed by a consumer.

Laboratory test

The laboratory test involves the test product (the product that is the subject of the Nordic Swan Ecolabel licence application) being tested in a laboratory and compared with a reference product. The reference product must be in the same category and have the same area of use as the test product, e.g., a concentrated floor cleaner for consumer use must be compared with another concentrated floor cleaner. The reference product must be a product in a conventional format (e.g., liquid, gel, powder, tablet) that is well-established/well-known in the market. The reference product in the laboratory test may be from the same manufacturer as the product for which a licence is being sought. Nordic Ecolabelling has not

specified a list of which reference products can be used, since cleaning products come in countless variations, making such a reference list extremely long and difficult to keep updated.

In order for the product to be judged effective, the test product must be equal to or better than the reference product and better than water. This latter point means that the tested cleaning product must have a better cleaning effect than cleaning just with water.

The requirements concerning the laboratory are set out in Appendix 3 of the criteria.

The instructions for the laboratory test can be found in Appendix 5.

Products that are marketed for multiple areas of use or other types of soil must be tested on all the key soil types for which the product is marketed, including soil types that may not be listed in Table 1 in Appendix 5 (e.g., soil containing protein and starch). WC cleaners must be tested for limescale.

For cleaning products for machines, the product shall be tested in the machine if possible. If it's not possible to test the product in the machine, soiled surface(s) shall be submerged in the diluted solution with minimal mechanical action (slow stirring of the solution) in order to best mimic the product's method of cleaning.

Outdoor cleaners are a separate category in Appendix 5. The soil types have been chosen to be soot, fat, oil, asphalt and biological material. As stated in the section “What can carry the Nordic Swan Ecolabel,” products claiming biocidal effects such as products killing algae cannot be labelled.

Micro-organisms added to cleaning products are meant to continue cleaning the surface over several days. To reliably document what is happening at a microbial level over time, Nordic Ecolabelling requires a laboratory test. Therefore, products containing micro-organisms must demonstrate residual cleaning effects via the laboratory test as instructed in Appendix 5 under heading "Prolonged effectivity test for products containing micro-organisms."

User test

In this revision, Nordic Ecolabeling considered to remove the alternative for professional products to meet the performance requirement with a user test. However, due to lack of standard test methods and difficulty in recreating in a laboratory the reality of how some professional products are used, Nordic Ecolabelling has instead revised the user test to be more robust. Now the user test must be performed by at least 5 users and the users need to be professional cleaning staff.

The EU Ecolabel’s user tests for “Hard-surface cleaning products” can fulfil this requirement only if 5 users who are all professional cleaning staff carry out the performance test. This is in line with Nordic Ecolabelling's revision of the user test requirements.

The user test involves the product being sent out, along with a questionnaire (found in Appendix 6 and Appendix 7 of the criteria), to a selection of testers/companies whose professional cleaning staff test the product at least 10 times in each place. After conducting the test, the tester considers how effective the test product was in comparison with the product that the tester usually uses (the reference product), which should be a product for the same purpose and in the same category. The tester then judges the performance based on:

- Ability to remove soil
- Gentleness to the cleaned surface (i.e., material care)
- Effectiveness
- In some cases, other criteria specific to the type of cleaner

For products containing microorganisms, Appendix 6 and Appendix 7 have extra questions about the long-term effect of the product compared with other products. This is to indicate whether the microorganisms have an additional effect from the users' perspective. However, a laboratory test is still required to demonstrate prolonged cleaning effect (see O11 Micro-organism requirement and lab test instructions in Appendix 5).

For a product to pass the test, 80% of the testers/testing companies must state that the product is as good as or better than the reference product.

For wash polish/wax-and-wash care products, the questions for the user test in Appendix 7 are divided into sections regarding application and cleaning/maintenance. The test persons will write how good they think the product is and at least 80% of the test persons need to give the product an overall grade of 3 or higher to give the product a final ok on performance.

3.6 Packaging requirements

Background to requirement O17 and O18 Design for recycling of packaging

To contribute to a circular economy, the sales packaging must be designed in a way that enables reuse and/or the best recyclability potential as well as the use of recycled material. The different materials used in the sales packaging must be separable from each other, so that the materials can be entered into their own material stream for recycling at end-of-life.

The sales packaging must either live up to the requirements above or alternatively, have a Recyclability certificate from RecyClass showing that the whole sales packaging is recyclable with a minimum recyclability score of B. Recyclability assessed by RecyClass guidelines are based on a traffic-lights system assessing the whole sales packaging with all it's components which means that in addition to the main body, closure systems, labels and sleeves, adhesives etc. are also included. The class ranking on the whole packaging cannot directly be compared with the individual requirements above and may thus vary at component level. RecyClass certificate with minimum score of B is, however, considered as a sufficient indication of the recyclability of the packaging. Documentation via certificate also simplifies the case handling of the requirement.

Bottle

“Plastförpackningar – En återvinningsmanual från FTI” (Plastic Packaging – A recycling manual from FTI, the company that was previously responsible for recycling packaging in Sweden) lists plastic packaging made from Polyethylene (PE), Polypropylene (PP) and Polyethylene terephthalate (PET) as the plastic types that are best from a recycling perspective. PP and HDPE packaging works for every stage of the recycling process. However, PET has a limited market of purchasers.[25]. Since these types of plastic are the

[25] Förpacknings- och Tidningsinsamlingen, Plastförpackningar – En återvinningsmanual version 0.7, June 2017.

best from a recycling perspective, Nordic Ecolabelling also sets requirement that the plastic bottles must be made from these plastic materials.

Compostable/biodegradable plastics such as PLA are not suitable for recycling in today's systems and can cause problems in the existing material recovery process. Such compostable/biodegradable plastic therefore does not fit in with the EU's objective of increasing material recovery and promoting the circular economy in the current Nordic recycling system as it stands today. Nordic Ecolabelling has therefore decided not to include compostable/biodegradable plastic on the list of accepted packaging materials.

Closure (caps/lids/pumps)

Since Polyethylene (PE), Polypropylene (PP) and Polyethylene terephthalate (PET) are the plastic types that are best from a recycling perspective, PS and PVC or plastics based on other types of halogenated plastics not allowed in the closure or label either.

An exemption is made for small parts in dispensing systems, as there are few dispensing systems on the market made of mono material and these small parts play a crucial role in the function of the dispensing systems. However, they must not contain PS, PVC or other halogenated plastics. For dispensing systems used on a PET bottle, each small part must have a density <1.0 g/cm^3, in order to separate from the PET during the sink/float process[26].

Silicone closures are not allowed on the bottles since the influence the recycling process in a negative way. The optimal is to have the closure in the same material as the bottle, see more under section "compatibility" below.

Colourants and printing

Nordic Ecolabelling wishes to encourage the highest possible quality and purity of the products that enter the material recovery systems. The leaflet from Plastkretsen and FTI also mentions the way that colourants and inks affect the recycling potential and the quality of recycled plastic. Reducing the use of chemical colourants is one of the tips given. Colourless plastics have the highest recovery value, making them easier to recycle. Dark colours that include carbon black can cause problems in modern and automated sorting plants, as the systems have difficulty analysing dark colours. These products can therefore end up in the residual waste fraction and not be recycled. Consequently, Nordic Ecolabelling sets requirements regarding colourants.

In the recycling process the pigments cannot be removed from the recycled materials. During discussions with the industry, Nordic Ecolabel has come to understand that when using recycled plastics, it is sometimes necessary to add pigments to tone the plastic to give it a more appealing colour.

The Nordic Ecolabel has decided to exempt packaging made from post-consumer recycled plastic from this requirement and they can be coloured/tinted. The coloration/tint cannot be done with carbon black, since that is the pigment that causes most problems during recycling.

Label

There is a strong interest from the recycling sector for the Nordic Ecolabel to set requirements on the labels that promote recycling, and there is a lot happening in this area

[26] Correspondence with Sina Lystvet, Grønt Punkt Norge, 2021-01-08

now both politically and technology wise. The Nordic Ecolabel's intentions are to follow the political development in Europe on this. The goal is to set requirements on packaging and labels securing good recyclability.

When it comes to recycling plastic packaging, the best alternative is when the label is made of the same material as the bottle. Otherwise, if the near-infrared sensor at the sorting facility hits the label instead of the bottle, the bottle may end up in the rejected fraction. Therefore, Nordic Ecolabelling sets requirements on labels to promote correct sorting and minimize rejects.

Fold-out labels are increasingly common. To ensure both the label's quality while on the package and recyclability of the package after use, Nordic Ecolabelling has set requirements for fold-out labels.

Paper labels on plastic bottles can cause fibres from the paper labels to be transferred into the recycled plastic and cause problems for the manufacture of new products. Therefore, paper labels are not allowed.

A float/sink bath is another sorting step that can sort plastics of different densities. For PET containers, only PP or PE labels with density <1.0 g/ml are allowed to ensure correct separation in the float/sink bath. (PET has a density > 1.0 g/ml). As a consequence, for the time being, cPET labels are not allowed.

PET-G labels/shrink film labels are excluded on PET containers since PET-G is problematic in recycling in large quantities as it is not compatible with the PET commonly used for the containers (A-PET).

PVC and other halogenated plastics are excluded since they lead to adverse environmental impacts in waste handling.

Laser printing is permitted as there are no inks used in the process.

Direct printing on the container is restricted, as ink residues lower the quality of the recycled plastic.

Metallized labels can be detected by metal detectors causing the packaging to be sorted to reject. Thin metal layers do not seem to possess major problems for the sorting or recycling, if the labels can be separated from the containers. However, these metal materials will not be recycled, and single use of metal is not supportable from a resource point of view.

Metal

Metal residues, for their part, cause plastics to be rejected if there are metal detectors on the sorting line. Metal residues can also break down the plastic and become a problem in later plastic production[27],[28]. An exception is made, however, for metal used for the foam function in foam flasks that are used repeatedly (professional products), as this is important from a quality perspective.

It was decided in December 2020 to allow metal parts in pumps, in line with criteria version 6.1 and onwards for hand dishwashing detergents. Recyclers have confirmed that while this

[27]Plaskretsen and FTI, Bättre förutsättningar för återvinning av plastförpackningar.
[28] http://www.plasticsrecycling.org/hdpe sourced on 08.08.2017

metal is not recycled as metal, it does not interfere with plastic recycling. However, pumps help with controlled dosing.

Compatibility

Inorganic filler can change the density of the plastic. If the plastic becomes too heavy, it sinks to the bottom in the water bath and is separated out for incineration instead of material recovery. This is why the criteria for cleaning products also contain a requirement that filler must not be added to the HDPE to such a level that its density exceeds 1 g/cm3 and to PP in such level that the density exceeds 1 g/cm3.

Nordic Ecolabelling proposed earlier to ban OPP and PP closures on HDPE bottles. The reason for this was that PP has a higher melting point than HDPE and thus causes problems when using the recovered HDPE fraction[29],[30]. PP labels on an HDPE bottle weigh very little in this context, but a PP closure on an HDPE bottle leads to too much PP in the HDPE fraction, in percentage terms[31]. However, the market is not yet ready for such a ban on PP closures on HDPE-bottles. There are advantages of having different plastic materials in closure and bottle when looking at how well the bottle is closed and avoids leakage. Producers state that it is hard to injection mold flip top closures in HDPE. It is also hard for the producers to go from HDPE bottles to PP bottles due to differences in mechanical properties. Nordic Ecolabelling has therefore chosen to instead add a text to encourage the user to separate bottle and closure before recycling. Nordic Ecolabelling will look closer on this and re-evaluate this during coming revisions.

Background to O19 Recycling design of pouches/plastic bags

Nordic Ecolabelling has had dialogue with Svenska Förpackningsinsamling (FTI, the company that was previously responsible for recycling packaging in Sweden) regarding pouches. They suggested only accepting pouches of PE since they are the easiest to recycle, but Nordic Ecolabelling has decided to use the same requirements on plastics as in O17 for bottles/containers etc. An extra requirement has been added regarding not allowing laminates of different material layers, i.e., the pouches must be made of mono-materials.

Nordic Ecolabelling has decided only accepting EVOH up to maximum 5% (in relation to the maximum weight) as a barrier coating. This is in line with what the recycling companies recommend so that the recycling process is not adversely affected. In the EU Ecolabel there is a requirement on barrier coatings banning polyamide barriers, functional polyolefins, metallised barriers and light-blocking barriers. The requirement of Nordic Ecolabelling also excludes these coatings.

The background for carbon black and filler requirements are the same as for plastic packaging (O17).

[29] Förpacknings- och Tidningsinsamlingen, Plastförpackningar – En återvinningsmanual version 0.7, June 2017.
[30] http://www.plasticsrecycling.org/hdpe sourced on 08.08.2017
[31] http://www.plasticsrecycling.org/hdpe sourced on 08.08.2017

Background to requirement O20 Cardboard packaging for liquid products: Design for recycling

There is a trend towards using cardboard packaging for cleaning products. Nordic Ecolabelling supports the shift toward this packaging format but sets strict requirements to ensure that only the most sustainable and resource-efficient solutions are accepted.

At least 90% by weight of the sales packaging must be made of bio-based material or post-consumer/commercial recycled material or a combination of these. This promotes the use of sustainable, renewable raw materials (both paper/paperboard and biobased plastics) or recycled material as an alternative to fossil-based plastics. Recycled material is defined according to ISO 14021, see definitions in chapter 5.1.

Halogenated plastics, such as polyvinyl chloride (PVC) and polyvinylidene chloride (PVDC) must not be used in the packaging because of emissions of harmful organic chemicals from the entire production chain and challenges with waste management during production and end of life. Read more about Nordic Ecolabelling's position on PVC here: PVC.

Oxo-degradable and biodegradable plastics must not be used since they “contaminate” the other recycled plastics streams in the Nordic region. Read more about Nordic Ecolabelling's position on biodegradable plastics here: Biodegradable plastics. Bio-based plastic in PET, PE and PP can be recycled in the same way as fossil-based plastic in PET, PE, and PP.

Metal must not be used for packaging as metal production is associated with a large climate and environmental impact. While aluminium from cardboard packaging for liquid products can be recycled, it’s excluded due to high energy consumption. Any aluminium use also drives demand for new aluminium, as recycling supply falls short. Direct print rather than the use of labels is preferable in the recycling process[32]. Printing ink must be compliant with EuPIA Charter on raw material selection and exclusion for printing inks and related products[33]. Surface treatment of the sales packaging with PFAS can occur. PFAS constitute a group of substances that have highly problematic intrinsic hazardous properties. Therefore, such surface treatment is prohibited in packaging of Nordic Swan Ecolabelled products.

For cardboard, a minimum of 70% by weight must be post-consumer recycled material or the wood raw material in the packaging must be FSC-/PEFC-certified. The remaining proportion of wood must meet the requirements of FSC controlled wood or PEFC controlled sources. The requirement limit, a minimum of 70% of all wood raw material (virgin or recycled), corresponds to the FSC and PEFCs requirement limits for use of the respective labels on products, such as "FSC Mix" and "PEFC certified". Recycled materials not covered by FSC/PEFC's Chain of Custody certification, can also be used in the packaging. The requirement must be documented as purchased amount annually.

Renewable raw materials can have a potential to give better environmental impact than fossil alternatives, but it depends on many parameters such as type of crop, where it is cultivated, cultivation conditions, land use change, further processing of the renewables and waste. Converting forest to cropland can have a huge impact on climate change and

[32] Personal communication with Cecilia Halling Linder, Fiskeby Board AB (December 2020)
[33] https://www.eupia.org/wp-content/uploads/2025/04/Ed8_EP_final.pdf

biodiversity. So, the possible benefits of replacing fossil-based raw materials with renewable raw materials will vary much and depend on responsible farming/forestry practices.

The establishment of palm oil and soybean plantations has led to vast areas of deforestation and destruction of natural habitats, thereby driving the loss of biodiversity in some of the world´s most precious places like the amazon and Cerrado in Brazil and Borneo in Indonesia[34]. Voluntary certification schemes for palm and soy are not yet considered good enough (by Nordic Ecolabelling) to protect against deforestation, and palm oil, soybean oil and soy flour are therefore banned as raw materials for bio-based polymers. This also applies to waste or residual product from the palm oil production such as palm Fatty Acid Distillate (PFAD) or Palm Oil Mill Effluent (POME).

Other renewable raw materials must be a) waste or residual products from i.e., agriculture, fishing, forestry or processing residual product defined in accordance with (EU) Renewable Energy Directive 2018/2001 or b) certified according to approved certifications schemes.

Nordic Ecolabelling has so far recognised Bonsucro EU and ISCC EU/Plus as valid certification schemes. The supplier of the bio-based polymer must have a valid chain of custody (CoC) certificate according to the standard by which the raw material is certified. Traceability must at least be ensured by mass balance. Book and claim systems are not accepted.

Background to requirement O21 Weight-Utility Ratio (WUR)

The purpose of the weight-utility ratio (WUR) is to reduce the amount of packaging and promote the use of recycled materials and refill options, thus helping to ensure a reduction in the unnecessary transport of packaging and air, and so lower CO2 emissions. WUR is a measure of the amount of packaging used to deliver an amount of product with a certain benefit. This restriction promotes the use of concentrated products by relating the amount of packaging to the dose.

Nordic Ecolabelling has chosen to set a requirement for primary packaging in the cleaning product criteria for two reasons: There is little steerability of distribution packaging and it punishes small-scale manufacturers unnecessarily harshly. In addition, it is through optimising primary packaging that the greatest environmental gains can be made for products such as cleaning products.

Included in the primary packaging is the weight of the packaging in which the cleaning product is packed. This also includes labels, closures and any fitted dosing devices, etc.

The requirement level is 1.0 for concentrated products, 175 for foam/spray products and 150 for other ready-to-use products. In addition, a weighting factor of 2.5 in the WUR calculation promotes the use of recycled material in the packaging. The requirement level for the WUR calculation has been set based on Nordic Ecolabelling’s experiences of the licensing work for both professional products and consumer products.

Nordic Ecolabelling values the requirement level for WUR as a means to exclude the most extravagant bottle designs, without preventing small bottles for concentrated products.

[34] https://www.worldwildlife.org/stories/deforestation-fronts (May 2024)

It is specified that t = 1 if there is no documentation that the packaging is reused multiple times. If t > 1 the manufacturer must be able to document this for example with sales figures for the number of refills in relation to the reusable packaging.

Manufacturers who can show that refills are sold in stores may also include the refills in their calculations. In such cases, however, Nordic Ecolabelling wishes to see the supporting documentation/marketing statistics.

The letter R in the equation stands for the amount of recycled material in the packaging.

R_i = Weight (g) of recycled material (postconsumer) in the packaging component (i) in grams.

The WUR requirement include an exemption for packaging that is made from more than 80% recycled material. The EU Ecolabel has introduced this in its criteria for Hard Surface Cleaning Products, and Nordic Ecolabelling believes it is an appropriate way to try to stimulate a high proportion of recycled packaging material.

Take-back system for a packaging is exempted since if packaging is recycled as such (taken back, washed and refilled) reduces the need for virgin materials and environmental impact of packaging significantly.

Background to requirement O22 Packaging for foam/spray products and mix-it-yourself RTU products

Requirement a) Cleaning foam/sprays with propellant differ from trigger foam/sprays in that the container is metal and the products contain propellants that are often flammable.

Requirement b) Products sold in foam/spray bottles have a different exposure scenario to products that are diluted in water before use and applied with a cloth or mop.

Use of a foam/spray forms a mist, which the user may breathe in. This increases the risk that the user will be exposed to allergens or other substances that pose health hazards. Several studies suggest a link between cleaning sprays and asthma in adults.[35] The amount of health-related aerosol fractions – inhalable, thoracic and respirable – in the spray mist can be significantly reduced by using a foaming nozzle.[36]

In the requirement there are two alternatives to show that the product does not produce large amounts of aerosol. The first alternative is that the product has a permanently mounted aerosol-reducing or foam nozzle on the packaging. The second alternative is that the producer reduces the aerosols by other means, for example by a viscous product. This can be approved if a test can show that the test product in original packaging has as low or lower amounts of inhalable, thoracic and respirable aerosol compared to a reference product with a mesh foamer. The reference product must be a Nordic Swan labelled product with for example mesh foamer.

[35] Siracusa A, et al. Asthma and exposure to cleaning products – a European Academy of Allergy and Clinical Immunology task force consensus statement. Allergy 2013;68: 1532–1545.
[36] Rengjøringsmidler i sprayform – Frigir de helseskadelige stoffer til arbeidsatmosfæren som kan inhaleres til lungene? Olsen, R., *et al.* (2017). STAMI report no. 2. ISSN no. 1502-0932. https://stami.no/wp-content/uploads/2017/02/STAMI-rapport20nr.202202017.pdf

The test must be performed in accordance with “Bestemmelse av inhalerbar, torakal og respirabel aerosolfraksjon” as described in Olsen et al. (2017),[37] The test must be performed at a laboratory fulfilling the requirements stated in section 1A in Appendix 3.

Requirement c) To minimize the risk to the user of the mix-it-yourself RTU products, it is required that the package must be shaped so that the user does not enter contact with the concentrate itself upon dilution. There are several ways to do that. For example, they may be enclosed tablets / pouches or ampoules of liquid detergent to be screwed into the cap of the reusable bottle.

3.7 Licence maintenance

Background to requirement O23 Customer complaints

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

If your company does not have a routine for customer complaint handling, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the customer complaint handling is implemented in your company as described. The customer complaints archive will also be checked during the visit.

Background to requirement O24 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.

[37] Rengjøringsmidler i sprayform – Frigir de helseskadelige stoffer til arbeidsatmosfæren som kan inhaleres til lungene? Olsen, R., *et al.* (2017). STAMI-rapport nr. 2. ISSN nr. 1502-0932. https://stami.no/wp-content/uploads/2017/02/STAMI-rapport20nr.202202017.pdf

4 Environmental impact of cleaning products

The purpose of this section is to clarify which environmental parameters, at which stages of the product lifecycle, the Nordic Ecolabel places requirements on for this specific product group and why.

The relevant environmental impacts found in the life cycle of cleaning products are set out in a MECO scheme 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). Nordic Ecolabelling sets requirements concerning the topics and processes in the life cycle that have a high environmental impact – also called hotspots.

Based on the hotspots identified, 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. The criteria contain requirements in those areas in the life cycle that have been found to have high RPS, since there is potential to achieve positive environmental gains.

When assessing the requirements to be set, there is a focus on setting requirements within the Nordic Swan Ecolabel's environmental strategic goals. The areas are biodiversity, climate and energy, chemicals, and resource use/resource efficiency (circular economy).

Based on these analyses, Nordic Ecolabelling recognizes a good potential to reduce important environmental impacts of cleaning products by setting requirements for:

- raw material sourcing - including requirements for plant materials for production of chemical raw materials (especially palm oil)
- ingoing substances - addressing exposure of chemicals harmful to health
- ecotoxicity and biodegradability - addressing impacts to aquatic organisms and ecosystems
- packaging - to address plastic and other packaging raw materials and disposal
- performance - to address chemical and packaging resource use and disposal (avoiding ineffective products that lead to overdosing, a problem that wastes both raw materials and packaging while increasing air and water pollution)

4.1 Material, Energy, Chemicals, Other (MECO) scheme

	Raw material	Production	Use	End of life	Transport
Material Extraction and resource loss	Extraction of oil, gas, metals, and minerals for non-renewable raw materials Agricultural production for renewable raw materials Water consumption		Water consumption in use (if applicable, e.g., for mixing concentrated products)	Loss of the material value if packaging is incinerated (higher impact) vs. recycled (lower impact)	
Energy (GWP = Global warming potential, LCA study from Koehler 2009)	Energy consumption to extract/cultivate and process raw materials for product and packaging (15-30% GWP in LCA - higher water content reduces raw chemical contribution but increases packaging contribution)	Energy consumption to produce product and packaging (ca 5% GWP in LCA for liquids; ca 10% for powder or solid products due to energy for drying)	Energy for heating water for product use (50-75% GWP in LCA, if applicable) Energy for transport from store to home by car (40-50% GWP in LCA for non-concentrated RTU products; otherwise <5%)	Energy from wastewater treatment and solid waste handling (5-20% GWP in LCA)	Energy use of transport vehicles (ca 5% in LCA)
Chemicals	Agricultural chemicals including pesticides and fertilizers Exposure to hazardous chemicals in the work environment or nearby communities	Exposure to hazardous chemicals in the work environment or nearby communities	Consumer and professional users' exposure to allergens and other hazardous chemicals Emission of VOCs during product use (if applicable)	Wastewater emissions of chemicals toxic to aquatic organisms Emissions of phosphorous compounds that cause eutrophication	Air pollution from transport vehicles
Other	Biodiversity and ecosystem impacts from resource extraction and agriculture Land right disputes and impacts on local and indigenous communities Raw material production competing with food production		Consumer and professional satisfaction influenced by product quality, effectivity, and shelf life Reduced wastage based on dosing instructions and design Reduction in accidents / improved child safety based on packaging design	Biodiversity and health impacts from hazardous chemicals from sewage sludge leaching to land and water Emissions of microplastics or nanomaterial (due to product's formula or using the product)	Particulate matter from transport vehicles

4.2 Relevance, Potential, Steerability (RPS) scheme

Life cycle stages	Area and assessment of R, P, S (high, medium or low)	Comments
Raw materials		
	Fossil oil for production of chemical raw materials R: High P: Low S: Low RPS: Low	R is high due to a large consumption of fossil-based raw materials and energy in production of chemicals. P+S are low, as there is low potential and steerability for minimizing the use of fossil resources for chemical raw materials, due to the limited availability of renewable alternatives for many raw materials. Also, a shift to renewable raw materials can lead to a burden shift concerning biodiversity (see next row).
	Plant materials (especially palm oil) for production of chemical raw materials R: High P: Medium S: High RPS: High	R is high due to non-sustainable extraction of renewable raw materials. P is medium. There is low potential and steerability for minimizing the use of palm oil resources for chemical raw materials, since palm oil is the origin of most renewable raw materials, and the availability of alternative renewable raw materials is currently low. Avoiding palm oil-based ingredients is difficult for consumers since origin of ingredients information is not generally provided. However, there is a high potential for minimizing the negative impacts of extraction of palm oil and other renewables. S is high as requirements for RSPO certified palm oil origin can be set together with a supply chain policy and code of conduct.
	Plastic and other packaging raw materials R: High P: High S: High RPS: High	R is high due to a large consumption of energy and fossil resources. P is high as the use of too much packaging and packaging that is not compatible with recycling is widespread, so there is a potential to limit the total amount of packaging and to promote design for recycling. There is also a potential for lowering the amount of packaging by requiring refills for RTU products. S is high as requirements can be set for the total amount of packaging, the type of packaging and the combination of packaging materials that enables emptying and recycling. The steerability for required refills is low, because it is difficult for the license holder to control the scale of refill sales in stores, but other refill solutions as home delivery in reusable containers can be an option.
	Water and electrical consumption for production of raw materials R: High P: Medium S: Low RPS: Medium	R is high due to consumption of energy and fossil resources. P is medium as there is a potential to limit the use of energy to lower emissions from production. S is low as the production facilities requires a certain amount of water and energy use to run, and Nordic Ecolabelling currently lacks information about how this can be reduced or possibilities to induce changes.
Production/distribution		
	Water and electrical consumption for production of the cleaning product R: Medium P: Medium S: Low RPS: Medium	R is medium due to consumption of water, energy, and fossil resources. We expect that water and electrical consumption is higher as raw materials are processed into intermediate ingredients earlier in the supply chain and lower in final production, but this can vary. P is medium as there is a potential to limit the use of water and of energy to lower emissions from production. S is low as the production facilities requires a certain amount of water and energy use to run, and Nordic Ecolabelling currently lacks information about how and to what extent this can be reduced.

	Water and electrical consumption for production of packaging R: High P: Medium S: Low RPS: Medium	R is high due to consumption of water, energy, and fossil resources to produce packaging. P is medium as there is a potential to limit the use of water and of energy to lower emissions from production. S is low as the production facilities requires a certain amount of water and energy use to run, and Nordic Ecolabelling currently lacks information about how and to what extent this can be reduced.
	Transportation from production to retail and to consumers R: Medium P: High S: Low PRS: Medium	R is medium due to consumption of fossil resources for fuel and particulate matter and emissions from distribution vehicles P is high as there is a potential to limit the use on non-renewable energy and to lower emissions from trucks, maybe also to organize logistics better. Product packaging and concentration can also affect transportation needs. S is low as distribution is carried out by external companies transporting both Nordic Swan Ecolabelled and non-Nordic Swan Ecolabelled products. Changing transportation types can require significant resources. However, requirements on weight-to-utility ratio for packaging and product concentration levels can be set.
Use phase		
	Water and electrical consumption when using the cleaning product R: High P: Medium S: Low RPS: Medium	R is high due to the use of water and consumption of energy and fossil resources for heating of water when using non-RTU products. P is medium as the use of water can be minimized and the temperature of the water can be lowered. S is low as energy resources used for heating of water is not often controlled by the users. Instructions/recommendations for use can help, but the steerability over users to limit water use or reduce water temperature is low.
	Exposure of chemicals harmful to health R: High P: High S: High RPS: High	R is high due to consumers being exposed to chemicals that are harmful to health P is high as there is a potential to limit or exclude ingredients with negative impact on health, like allergens, CMR substances, endocrine disruptors. Special requirements for foam/spray products, which can be inhaled, can be set. For non-RTU products there is also a potential to limit overdosing and thereby minimizing the exposure. High efficacy can also help to reduce overdosing. S is high as requirements to prohibit or strongly limit problematic substances can be set. The amount of product used can be limited by clear instructions for use and foam/spray nozzles that reduce the formation of inhalable aerosols. Requirements for efficacy can be set.
End of life		
	Water and electrical consumption for wastewater treatment R: Medium P: Low S: Low RPS: Low	R is medium due to consumption of energy and fossil resources. P is low as there is no potential for the licensees to limit the use on energy. S is low as the sewage treatment plants are run by the public sector and hence difficult to affect by the producer of cleaning products.
	Packaging disposal (incineration, reuse or recycling) R: Medium P: High S: High RPS: High	R is medium due to the loss of fossil resources, if the packaging is not recycled. P is high as the use of too much packaging and non-compatible packaging components is widespread, so there is a potential to limit the total amount of packaging and to promote design for recycling. S is high as requirements can be set for the total amount of packaging, the type of packaging and the combination of packaging materials that enables emptying and recycling.

	Product emissions from use (degradability and toxicity to aquatic organisms) R: High P: High S: High RPS: High	R is high as cleaning products and their ingredients can all end up in the environment affecting biodiversity, even though they might take different routes. Cleaning products therefore risk harming both aquatic organism and the ecosystem, depending on the intrinsic properties of the ingredients. P is high as there is a potential to reduce the content of environmentally hazardous ingredients like, substances toxic to aquatic organism, non-degradable substances, microplastics, endocrine disruptors etc. S is high as requirements to prohibit or strongly limit problematic substances can be set.

Sources for MECO and RPS

AISE (2019). Charter for sustainable cleaning 2020+. Advanced Sustainability Profiles substantiation dossiers. https://www.sustainable-cleaning2020.com/company-area/charter-2020-documentation

Boyano, A. and R. Kaps, G. Medyna, O. Wolf (2016). Revision of six EU Ecolabel Criteria for detergents and cleaning products. Main environmental hotspots, pp. 8-14. https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/contentype/product_group_documents/1581681262/Technical%20background%20report.pdf

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2015). Closing the loop – An EU action plan for the Circular Economy, COM 2015 614 final, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614

European Commission, Joint Research Centre, Faraca, G., et al. (2024). Ecodesign for Sustainable Products Regulation: Study on new product priorities, (see especially "detergents" and "commodity chemicals," pp. 63,65,122,126,175-188). Publications Office of the European Union, Luxembourg, 2024, https://data.europa.eu/doi/10.2760/7400680, JRC138903

Golsteijn, L. and R. Menkveld, H. King, C. Schneider, D. Schowanek, S. Nissen (2015). A compilation of life cycle studies for six household detergent product categories in Europe, Environmental Sciences Europe, 2015, 27:23. http://enveurope.springeropen.com/articles/10.1186/s12302-015-0055-4

Kapur et al. (2012) Comparative life cycle assessment of conventional and Green Seal-compliant industrial and institutional cleaning products, International Journal of Life Cycle Assessment, DOI: 10.1007/s11367-011-0373-8 https://findit.dtu.dk/en/catalog/600d7ba7d9001d0196161627

Koehler, A. (2009). Comparing the Environmental Footprints of Home-Care and Personal-Hygiene Products: The Relevance of Different Life-Cycle Phases, 2009, Environ. Sci. Technol, 43, 8643–8651. https://assets.website-files.com/60785920d3e83f34edf78d07/612d9f94be86e62781325e80_Envtl%20Sci%20Tech%202009.pdf

Medina et al. (2015) Revision of the European Ecolabel Criteria for: All-purpose cleaners, sanitary cleaners and window cleaners, JRC Science for Policy Report, DOI: doi:10.2791/923 https://publications.jrc.ec.europa.eu/repository/handle/JRC96849

Roundtable on Responsible Palm Oil (RSPO) (2017). RSPO Theory of Change. https://rspo.org/wp-content/uploads/FA_RSPO-Theory-of-Change_Narratives_Lores_Spreads.pdf

Stockholm Vatten och Avfall (accessed 2025.02.17) Så här renas avloppsvatten. https://www.stockholmvattenochavfall.se/kunskap/sahar-renas-vatten-och-avlopp/avloppsrening/restprodukter/

Suikkanen, J. and A. Nissinen, M. Wesnaes (2019). Nordic Swan Ecolabel and Product Environmental Footprint: Focus on Product Environmental Information. https://norden.diva-portal.org/smash/get/diva2:1354808/FULLTEXT01.pdf

Thannimalay, L. and S. Yusoff (2014). Comparative Analysis of Environmental Evaluation of LAS and MES in Detergent – A Malaysian Case Study, World Applied Sciences Journal 31 (9): 1635-1647, 2014. https://www.idosi.org/wasj/wasj31(9)14/16.pdf

Tonning, K. et al. (2010). Survey and Health Assessment of Products for Interior Car Care. Danish EPA. https://www2.mst.dk/udgiv/publications/2010/978-87-92548-93-1/pdf/978-87-92548-94-8%20.pdf

Upphandlingsmyndigheten Sverige (2022). Identifiera hållbarhetsrisker I leveranskedjan: Kemiska produkter https://kriteriedatabas.upphandlingsmyndigheten.se/bilagor/29175/Riskanalys%20-%207.1%20Kemiska%20produkter%20.pdf