About Nordic Swan Ecolabelled

Cleaning products

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Background document

Nordic Ecolabelling

Content

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This document is a translation of an original in Swedish. In case of dispute, the original document should be taken as authoritative.

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
info@ecolabel.dk
www.svanemaerket.dk

Iceland
Ecolabelling Iceland
svanurinn@ust.is
www.svanurinn.is

Finland
Ecolabelling Finland
joutsen@ecolabel.fi
www.joutsenmerkki.fi

Norway
Ecolabelling Norway
info@svanemerket.no
www.svanemerket.no

Sweden
Ecolabelling Sweden
info@svanen.se
www.svanen.se

1 Summary

This background document contains a brief description of the product group and the impact of cleaning products on health and the environment, a market overview and background to the requirements set out in the criteria document.

Cleaning products are a heterogeneous product group that includes both concentrated and pre-diluted products for consumers and professional users. The products are intended for general and regular cleaning of fixed surfaces (floors, walls, WCs, etc). The product group has in this generation been extended to also include products for outdoor usage with facade and terrace cleaners and with textile floor cleaners.

Nordic Ecolabelling has concluded that the most relevant environmental parameters for cleaning products are:

- emissions of hazardous, non-degradable and/or bioaccumulative substances in the environment, which place a burden on treatment works and/or recipients,
- the amount and type of packaging material,
- extraction of raw materials and
- over-dosing, which contributes to every part of the life cycle.

Setting criteria on the toxicity and degradability of the constituent substances, the amount and design of the packaging and sustainable extraction of raw materials can reduce the burdens on our external environment.

There are, in addition, certain health-related problems such as allergies that are associated with cleaning products. The criteria also cover these aspects.

The most significant changes made in this generation of the criteria are:

- New information requirement concerning sustainable and renewable raw materials (O2)
- New requirement for sustainably produced palm oil (O3)
- Ban on the sensitising preservative MI (O7/O18)
- Simplification and harmonisation of the various product types and adjustment of limit values accordingly (O12, O13, O22, O23)
- New requirements for packaging that promotes the circular economy (O26–O28)
- New requirement concerning foam nozzle for spray products (O29)
- The criteria document has been separated into two parts to make it clearer what is required for cleaning products vs was polish/wash-and-wax care products.

For other changes, see Table 2 Changes from generation 5 to 6 in section 8 Changes compared with the previous generation.

The environmental gains from generation 5 to 6 can be summed up as coming in particular from the raw materials phase of the life cycle and the packaging. The sustainable extraction of raw materials is a vital global issue with a major environmental impact. Setting information and policy requirements, Nordic

Ecolabelling creates awareness of the issue, while the requirement for sustainably produced palm oil helps us contribute to the production of more sustainable raw materials. Tighter and new packaging requirements limit the use of packaging materials and contribute to a circular economy. New substances on the list of prohibited substances and a total ban on MI guarantee better cleaning products in terms of both health and the environment.

2 Basic facts about the criteria

This chapter is an introduction to the criteria for the Nordic Swan Ecolabelling of cleaning products and contains a description of the product group definition, a short explanation of why Nordic Ecolabelling has these criteria and a description of the version history and validity.

Products that can be labelled

The criteria apply in the first instance to general cleaning and not specialist cleaning products.

Cleaning products designed to clean fixed, hard surfaces (floors, walls, countertops, windows etc.) in the form of concentrated products and RTU (Ready-to-use) products. Spray products can only be Nordic Swan Ecolabelled if they have a permanently mounted foam nozzle, see requirement O29. Products for cleaning of textile flooring can also be Nordic Swan Ecolabelled.

The product group encompasses cleaning products intended for indoor, general and regular cleaning of:

- fixed surfaces (floors, walls, ceilings, doors and tiles
- kitchen equipment (for example work surfaces, kitchen cabinets, stoves, ovens)
- sanitary installations (for example WCs, baths, showers, wash basins, cabinets and mirrors)
- Windows (inside and outside)
- Textile flooring, such as carpeted floors
- Wash polish/wash-and-wax care products

The product group also includes the following types of cleaning products for outdoor usage:

- Facade cleaning
- Patio/terrace cleaning

Concentrated products for the professional market containing microorganisms are also included in the product group, but only for indoor use.

Products for the professional market (products are considered professional if more than 80% of sales are to the professional market) and/or consumer products can be labelled.

Sub-categories

The product group is divided into subgroups, which also can be found under requirements where there are several different requirement levels.

Concentrated, professional: This category includes professional products that require dilution with water prior to use. It contains products for all the aforementioned surfaces, such as floors, walls, ceilings, kitchen work surfaces, tiles, WCs, bathtubs and showers. Tablets/capsules/granulates are included in this category. Chemical products for cleaning of textile flooring is also included in this sub-category. Tablets/capsules/granulates are included in this category.

RTU (Ready-to-use), professional (other except windows): Professional products that are pre-diluted and ready for use including foam/spray products. This category includes products for WCs, kitchens, oven, bathtubs, showers, windows and so on, but not for large areas* such as floors.

RTU, window cleaner, consumer and professional: Professional window and glass cleaners that are pre-diluted and ready for use straight from the package including foam products.

Concentrated, consumer: Concentrated products that require dilution with water prior to use and are designed for the consumer market. This category contains products for all the aforementioned surfaces in the home, such as floors, walls, ceilings, windows (inside and outside), kitchen work surfaces, tiles, WCs, bathtubs and showers. Tablets/capsules for WCs are included in this category. Wash polish/wash-and-wax care products for consumer use are also included.

RTU, WC, consumer: Consumer WC cleaners that are pre-diluted and ready for use straight from the package. This category only includes products for use on WCs, and excludes cleaners for other sanitary porcelain and bathroom cleaners.

RTU, consumer (other except windows and WC): Pre-diluted consumer products that are ready to use without dilution including foam products. This includes products for kitchens, ovens, bathtubs, bathtubs, showers and so on, but not for large areas* such as floors. Please note requirement O29 regarding foaming nozzles.

**The term "large areas" refers to areas such as floors and tiled bathroom walls. RTU products shall be intended for use on smaller surfaces and "spot cleaning".*

Concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water can be Nordic Ecolabelled together with the RTU product. The product may be e.g.,, a vial or a tablet. The common thing is that the product is diluted up to 100 times to a use solution in a bottle and that the person handling the concentrated products does not run the risk of coming into contact with the product when it is diluted to the finished product.

Wash polish/wash-and-wax care products: combined cleaning and polish improvers. They contain care products: film-forming components such as polymers, resin and/or wax. Wash-and-wax care products here are concentrated products diluted prior to use.

Facade and patio/terrace cleaning; concentrate: Products intended for cleaning outside such as cleaning facades, patios and terraces.

Concentrated products that can be used both in a diluted state, such as diluted in a bucket of water, and in a more concentrated state, such as diluted with a small quantity of water for use in a foam bottle, must fulfil the requirements for both concentrated (diluted in bucket) and RTU (spray bottle) products.

Products that are sold on both professional and consumer markets must fulfil the requirements for professional products.

Products designed for several areas of use, such as WC and bathroom cleaner (walls, floor and so on), must fulfil the requirements of each applicable category.

Cleaning products intended for 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
- cleaning wipes
- Floor wax and floor polish without cleaning effect

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

Justification for Nordic Ecolabelling

Nordic Ecolabelling sets requirements within the parts of the product's life cycle where there is relevance, potential and steerability (RPS). Nordic Ecolabelling also has a further focus on setting requirements in the following environmentally strategic areas: biodiversity, climate and energy, chemicals and resource use/resource efficiency.

The important parameters according to the MECO and life cycle analyses[1] are the extraction and production of raw materials (choice of surfactants), packaging,

[1] Laura Golsteijn, Rimousky Menkveld, Henry King, Christine Schneider, Diederik Schowanek and Sascha Nissen, A compilation of life cycle studies for six household detergent product categories in Europe: the basis for product-specific A.I.S.E. Charter Advanced Sustainability Profiles, Environmental Sciences Europe – Bridging Science and Regulation at the Regional and European Level 2015 27:23, http://enveurope.springeropen.com/articles/10.1186/s12302-015-0055-4, 5 October 2015; EDP of E' COSI' http://gryphon.environdec.com/data/files/6/9651/epd302it_ECosi_Detergents_2015.pdf, in search on "detergents" at http://www.environdec.com/en/EPD-Search/ (24.02.2017); GreenSeal: Amit Kapur, Cheryl Baldwina , Mary Swanson, Nana Wilberforce, Giovanna McClenachan, Mark Rentschler, Comparative Life Cycle Assessment of Conventional and Green Seal-Compliant Industrial and Institutional Cleaning Products, http://www.greenseal.org/Portals/0/Documents/Standards/GS-37%20LCA.pdf; AFISE: Association Française des Industries de la détergence, de l'entretien, de l'hygiène et des produits d'hygiène industrielle, COMPARATIVE LIFE CYCLE ASSESSMENT STUDY 3

the use phase (water temperature, quantity), emission of chemicals in the use and waste phases (ecotoxicity and biodegradability) and transport. Dosing and performance affect all these parts of the life cycle.

There is relevance, potential and steerability in all these areas, with the exception of controlling water temperature and quantity, which is an area over which Nordic Ecolabelling has no steerability. Nordic Ecolabelling is able to influence the sustainable extraction of raw materials via an information and policy requirement. Packaging has a major environmental impact and the fact that the manufacturers choose their own packaging ensures steerability in the requirements. Our packaging requirements contribute to a circular economy. Requirements concerning biodegradability, bioaccumulation and toxicity for aquatic organisms encourage fewer emissions of undesirable substances in the use and waste phases. Transport is a more difficult area when it comes to steerability, but we can influence it indirectly by promoting concentrated products, which leads to less transporting of water.

By setting requirements for dosing instructions and performance testing, we indirectly influence every part of the life cycle and steer consumers towards more sustainable products.

See also section 5 Environmental impact of cleaning products for more background on the requirements for this product group.

Nordic Swan Ecolabelled cleaning products:

- Meet strict requirements concerning environmentally hazardous chemicals, including requirements on ecotoxicity and biodegradability
- Meet strict requirements concerning chemicals that are harmful to health, including a ban on the sensitising preservative MI
- Offer effective cleaning performance with a small amount, so the product lasts longer and conserves the planet's resources.
- Packaging requirements contribute to a circular economy, for example by addressing packaging design and material choices.

Version and validity of the criteria

The criteria for cleaning products were previously spit into all-purpose cleaning products and sanitary cleaning products.

All-purpose cleaning products

The first generation was adopted in September 1993 and included requirements concerning harmfulness to health and the environment, the ecotoxicological properties of surfactants and requirements targeted at certain specific substances/substance groups.

CLEANING PRODUCTS FOR KITCHEN SURFACES FRENCH STUDY, http://docplayer.net/6306344-Comparative-life-cycle-assessment-study-3-cleaning-products-for-kitchen-surfaces.html, 2004

Generation 2 was adopted on 10 December 1998. The changes related mainly to the development of a new environmental matrix to which the requirements were linked, and a tightening of the performance test.

Sanitary cleaning products

Generation 1 was adopted on 26 August 1994. The requirements related to harmfulness to health and the environment, surfactants, complexing agents, disinfectant substances, preservatives, colourants and fragrances. There was also a requirement for an information text regarding dosing, packaging and performance requirements, and requirements targeted at certain specific substances/substance groups.

Generation 2 was adopted on 22 April 1999. The changes related mainly to the development of a new environmental matrix (to which the requirements concerning toxicity/biodegradability, phosphorus, NTA, potentially non-biodegradable substances, non-aerobically biodegradable substances and the weight-utility ratio of the packaging were linked), and a tightening of the performance test.

Cleaning products

The criteria for all-purpose cleaning products and sanitary cleaning products were merged on 15 June 2003, and the new criteria were named “cleaning products, generation 3”. The biggest changes in generation 3 of the criteria, compared with 2, were:

- the merger of all-purpose cleaning products and sanitary cleaning products
- a lower maximum limit for substances with relatively high toxicity and low biodegradability
- a more flexible performance test
- a ban on antibacterial products
- updated requirements for the classification of the products
- health-related requirements concerning fragrances (ban on carcinogenic substances and a duty to declare allergenic substances)
- products whose sole purpose was to remove limescale were no longer covered by the criteria for cleaning products

Generation 4 was adopted on 13 December 2007. The key changes between generations 3 and 4 were:

- strict limits on substances classified as most environmentally hazardous (R50/53) and a ban on CMR substances (substances that are carcinogenic, mutagenic or toxic for reproduction)
- tighter requirements on allergenic substances
- tighter limit values for the permitted quantity of substances classified as R51/53 and R52/53
- GN was reformulated as CDV (a product’s “toxicity and biodegradability”, which is related to the EU’s DID List) and the limit was tightened

Generation 4 contained a time-limited requirement on restricting fragrances. Since 1 January 2010, however, there has only been one alternative, which means that fragrances that are subject to declaration and/or classified as R42 and/or R43 are limited to no more than 100 ppm (0.010%) of the product.

Generation 5 was adopted on 13 March 2013 and remained valid until 31 March 2017. The key changes compared with generations 3 and 4 were:

- amended limit values for CDV (critical dilution volume R11) and biodegradability, plus transition to only using chronic data in the CDV calculation
- new limit value for WUR (weight-utility ratio) for pre-diluted products
- ban on phosphorus
- ban on fragrances in professional spray products
- amended calculation and limit values for environmentally hazardous substances

During the period of validity, generation 5 was expanded to include cleaning products for the professional market that contain microorganisms, outdoor window cleaners, oven cleaners and wash polish/wash-and-wax care products.

Nordic Swan Ecolabel licences in the Nordic Market

The number of licences for the Nordic Swan Ecolabel has remained quite stable in recent years, but the number of products has increased. In the professional market, the demand for more eco-aware products in public procurement has been one of the driving factors behind the higher number of products. There are Nordic Swan Ecolabelled licences in all the Nordic countries except Iceland.

In May 2017 there were 62 licences for cleaning products in the Nordic market, covering more than 2,000 products. These are distributed as shown in Table 1 below. The licences cover products for both the consumer market and the professional market.

Table 1 Number of licences in each Nordic country (May 2017)

Country	No. of licences
Denmark	**23**
Finland	**7**
Norway	**12**
Sweden	**20**
Iceland	**0**

The Nordic market

Products from large, medium-sized and small manufacturers are available on the Nordic market for both professionals and consumers. The products are manufactured both within and outside the Nordic region (in this case mostly in the rest of Europe).

Consumer market

The consumer market includes private label (supermarket own brand) products that are manufactured primarily in the Nordic region (e.g., Nopa, Danlind,

Cleano Production). Some of the private label products are, however, manufactured elsewhere in Europe (McBride and Dalli de Klok, for example). Branded products from global names such as Colgate, Reckitt Benckiser, Unilever and SC Johnson are manufactured in Europe for the Nordic market. In Norway, Orkla Home&Personal Care (Lilleborg) is the leading manufacturer and they have factories in Norway and Sweden. Kiilto is a major Finnish manufacturer with production based in its home country. Several smaller producers also manufacture products in Finland.

On the consumer front, the main sales channel is the supermarkets. Supermarket chains therefore have considerable influence over the products that appear on the market. In Sweden, a large proportion of the consumer products are currently ecolabelled, in part due to a decision by supermarkets to primarily sell ecolabelled household chemicals.

As of July 2017, Nordic Swan Ecolabelled stores can be found in Sweden (146), Norway (11) and Denmark (15), and all of these sell Nordic Swan Ecolabelled household chemicals such as cleaning products. Finland currently has no Nordic Swan Ecolabelled stores.

Professional market

In the professional market, there are a number of manufacturers with production in the Nordic region and beyond, such as Diversey, Ecolab, Nilfisk, Cleano Production, Iduna, Sæbefabrikken, Novadan, KiiltoClean and Lilleborg.

The products are sold either directly by the manufacturers, who have their own sales channels (e.g., restaurants, hotels and cleaning companies), or via wholesalers such as Staples, Asko and Norengros.

Public procurement is placing a growing focus on environmental concerns, which is increasing demand for ecolabelled products.

Market trends

Cleaning using microfibre cloths is on the increase in the Nordic market, but this does not mean going entirely chemical-free, as mops and cloths are laundered with various cleaning products/laundry detergents, and the cleaning product intentionally remains in the mop after laundering. Professional users are, however, working towards lesser use of chemicals.

In the professional market for cleaning products, the main trend is towards cleaning machines, cleaning systems and controlled dosing, with little focus on actual chemical product development.

The use of various cleaning wipes has also become more common among professionals and consumers. Their market share is estimated to be around 10–15% in the Nordic countries.[2] The market is expected to grow steadily but moderately, with most growth in the homecare market.[3]

[2] Communication with the manufacturers
[3] Presentation at Go Wipes Conference, Smithers-Pira, Global Overview of the Wipes Market, 14.11.2016

Environment as a competitive advantage

The demand for ecolabelled products is relatively stable, but an increase can be seen, for example in professional products that are used by Nordic Swan Ecolabelled cleaning services.

3 Other labels

Regulatory requirements

Cleaning products are regulated primarily via the Detergent Regulation (EC) No. 648/2004. The raw materials are also included in REACH and some of the raw materials may be affected by the Biocides Directive. The products must be labelled in line with the Detergent Regulation and classified and labelled in line with the CLP regulation.

Specific national regulatory requirements in the Nordic region

In Norway, the content of phosphorus in detergents (including cleaning products) is regulated by the Product Regulations (Section 2-12)

Ecolabelling type 1

The Swedish Society for Nature Conservation has the **Bra Miljöval** (Good Environmental Choice) ecolabelling criteria, which cover cleaning products[4].

There are 159 cleaning products (which includes the subcategories all-purpose cleaners, soap, WC cleaners and deep cleaning products) that carry the Bra Miljöval label[5]. There are also 12 window cleaners. 55 of these products are for consumers and 104 are for professionals.

New criteria for the **EU Ecolabel** were adopted on 23 June 2017. These criteria cover cleaning products for both the professional and consumer markets. Products containing microorganisms are excluded from the criteria. According to the EU Ecolabel there are no products currently labelled under the new criteria for cleaning products. There are, however, more than 300 products that carry the EU Ecolabel under the previous generation of the criteria.[6] These licences are valid up to December 2017.

Environmental product declarations (EPDs)

Environmental product declarations give detailed environmental information without any particular requirements being placed on the products. There are also no present requirement levels. The usefulness of the declaration depends on the purchaser's knowledge of the environmental credentials of the product being purchased, and the value in making comparisons depends on the EPDs being drawn up using the same system parameters and conditions. There is no international system for environmental product declarations, but work is underway in this area within ISO. In order to make an environmental product declaration, product category rules (PCRs) must be in place or created.

[4] http://www.naturskyddsforeningen.se/sites/default/files/dokument-media/bra-miljoval/KemiskaProdukter/kriterier_kem_20150312.pdf (23.02.2017).
[5] http://www.naturskyddsforeningen.se/bra-miljoval/register (23.02.17).
[6] http://ec.europa.eu/ecat/category/en/1/all-purpose-cleaners-and- (23.02.2017).

The system is not well developed for chemical products. The international EDP system website has an EDP for cleaning products[7].

Green Public Procurement (GPP)

The EU has official "GPP Criteria for Cleaning Products & Services"[8], which cover both cleaning products and dishwashing detergents, as well as cleaning services. The criteria state that ecolabelled products that carry a type 1 ecolabel meet both the "core criteria" and the "comprehensive criteria".

Environmental management

Environmental management systems bring order to a company's own operations and produce improvements based on the company's own targets in the environmental field. However, an environmental management system does not contain any specific requirement levels (limit values) for the products or their production. The most important systems are EMAS, which was developed by the EU, and ISO 14001, which is an international standard. Many manufacturers of cleaning products have environmental management systems in place within their companies. The standards under which they are certified may vary, however.

Raw materials labelling and traceability systems

Traceability systems for raw materials are not commonly used in cleaning products. Surfactants are the largest raw material group in cleaning products. Surfactants are made entirely from fossil raw materials, entirely from renewable raw materials, or a surfactant may contain both fossil and non-fossil raw materials. Some surfactants derive partly or entirely from palm oil. It is thus possible to require a proportion of renewables in surfactants without any great need for reformulation of the product. For palm oil there is a RSPO certification system (Round Table för Sustainable Palm Oil).[9] Some producers use already today RSPO certified raw materials, but the level of certification is unclear.

Nordic Ecolabelling's views on raw materials labelling and traceability systems

Nordic Ecolabelling's raw materials group has examined the RSPO standard in relation to the requirements we set for raw material labels, and t the current time, these two systems do not fully meet Nordic Ecolabelling's requirements for sustainability labels. Generally, the standard provides too poor protection for important biological areas since it is among other things permitted to establish plantations on peat bogs, which are an important carbon sink. As the production of palm oil currently has major environmental consequences, wishes Nordic Ecolabelling to introduce as stringent requirements as possible within the framework of the respective product group.

In the product groups where there are alternative raw materials and steerability to exclude palm oil without the consequence of a "Burden Shift", Nordic Ecolabelling wishes to exclude the use of palm oil.

[7] EDP of E' COSI' http://gryphon.environdec.com/data/files/6/9651/epd302it_ECosi_Detergents_2015.pdf, in search on "detergents" at http://www.environdec.com/en/EPD-Search/ (24.02.2017)
[8] EU GPP criteria: http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm (visited Aug 2016)
[9] RSPO: http://www.rspo.org/, (besökt 2016-09-20)

In product groups where there are no alternatives and no steerability for Nordic Ecolabelling to avoid these raw materials, Nordic Ecolabelling wishes to set as stringent requirements as possible. This is to ensure that the most environmentally friendly alternative is used in Nordic Swan Ecolabelling's products. In these cases, Nordic Ecolabelling judges that RSPO, with its associated traceability systems, the best tool in the market and will therefore require it.

RSPO is a system that point in a positive direction and Nordic Ecolabelling wishes to keep an eye on this development, in order to potentially accept and use it in all criteria in the future.

Other private labelling

Charter for Sustainable Cleaning

In 2005, the industry initiated the pan-European "Charter for Sustainable Cleaning" to promote sustainability among companies manufacturing laundry/dishwasher detergents and other cleaning products for household and commercial use. The programme was launched on the initiative of the International Association for Soaps, Detergents and Maintenance Products (A.I.S.E.). The charter applies in all 27 member states of the EU as well as Norway, Iceland and Switzerland and is open to all companies manufacturing or distributing such products in this region.

To participate in the programme, a company must annually report key performance indicators to A.I.S.E. (such as chemical safety evaluation, non-readily degradable organic substances, energy and water consumption and packaging), but there are no limit values that have to be met. A.I.S.E. has summarised these in a "sustainability report"[10].

The charter was updated in 2010, with the main change being to allow companies to submit "a sustainability assurance for individual products, with an enhanced Charter logo" by showing that the companies meet the new Advanced Sustainability Profiles (ASP)[11]. As of today, there are criteria for nine product groups, including three product groups that fall under the criteria for the Nordic Ecolabelling of cleaning products (Household Dilutable All Purpose and Floor Cleaners, Household Trigger Spray Cleaners (Glass/Window, Bathroom, Kitchen and All Purpose for hard surfaces), Household Toilet Cleaners)[12].

According to A.I.S.E. the product requirements are based on LCA analyses of the product types and their environmental impact. A.I.S.E. states that the Environmental Safety Check of the formulation is risk-based, and in line with the principles of REACH. The requirements also have a focus on dosing, packaging and information for the user.

[10] https://www.sustainable-cleaning.com/en.publicarea_sustainabilityreport.orb (23.02.2017).
[11] https://www.sustainable-cleaning.com/content_attachments/documents/Charter%202010_OperatingRules_ver04March2011.pdf (23.02.2017)
[12] https://www.sustainable-cleaning.com/en.companyarea_documentation.orb (23.02.2017).

Asthma and Allergy

The Asthma and Allergy Associations in each Nordic country have developed their own label, including for various chemical products. The label focuses on minimising the risk of allergic reactions from use of the product. The labels are managed differently in all the Nordic countries by the local Asthma and Allergy Association. It is mainly a health label that can be found on chemical products such as laundry detergents, rinsing agents, dishwashing detergents and soaps. The associations have open requirements[13], [14], [15], [16], but none of the associations have published entirely specific or precise requirements. Labelling of a product is determined by case officers or a product assessment board.

AllergyCertified

AllergyCertified was launched in 2014 as a competitor to the Nordic Asthma and Allergy Association labelling systems[17]. AllergyCertified is a global label. The products awarded the label have been checked and undergone an allergy risk assessment. The individual requirements for awarding the label are not publicly available but fragrances and allergens are not permitted.

As this is a new label, at the current time there are only a few products, none of them cleaning products, that are approved under AllergyCertified.

4 About the criteria development/revision

This chapter presents the goals of the revision and describes their implementation.

Purpose of the criteria development/revision

The main goal has been to create clear and credible criteria that take account of both health and environmental issues and encourage effective products. We will achieve this via tighter packaging criteria that promote the use of recycled plastic, a new requirement concerning renewable raw materials and a tighter requirement regarding preservatives. The many product types in the criteria for cleaning products thus need to be merged in order to make the criteria simpler and harmonise the requirement levels. The revised criteria aim to have a broad application, so that as many cleaning products as possible that are covered by requirement O6 Proportion of ecolabelled chemicals in cleaning services can be ecolabelled under the criteria for cleaning products. The revised criteria also aim to make the application and administration process simpler and clearer.

In a drive to achieve more environmental gains, the focus of the revision has been on:

[13] http://www.naaf.no/marked-og-produkt/naafs-merkeordning/kriterier-for-produktvurdering/#Rengjøringsprodukter (23.02.2017)
[14] http://astmaoallergiforbundet.se/wp-content/uploads/2016/10/Kriterier-Kem-tekn.pdf (23.02.2017)
[15] https://www.allergia.fi/allergiatunnus/kriteerit/ (23.02.2017)
[16] http://www.astma-allergi.dk/producent/kriterier (23.02.2017)
[17] http://allergycertified.com/ (visited 08.05.2017)

- The opportunity to introduce an information requirement concerning use and the sustainability of renewable raw materials, along the lines of cosmetics
- Updated WUR requirements to promote new, lighter packaging innovations or more recycled material in packaging, thus helping to reduce the use of fossil raw materials and virgin packaging material
- Tighter requirements concerning sensitising preservatives and fragrances
- CDV amendments to align with DID2016 or later
- Potential expansion to include wet wipes

Other requirements have been reviewed and some have been slightly adjusted.

About this criteria development/revision

The project has been run as a Nordic project, in close conjunction with the revision of hand dishwashing detergents. At the start of the project all countries produced national documentation on criteria, industry information and other national information in a workshop. During the course of the project, licence holders, raw material and packaging manufacturers, industry associations and other stakeholders in the various countries have been contacted in order to tap into the knowledge, experience and interests of the industry.

Project participants:

Project Manager	Terhi Uusitalo (FI) / Susanna Vesterlund (SV)
Project Consultant	Thor Hirsch (NO) / Terhi Uusitalo (FI)
Product specialist NO:	Arne Godal
Product specialist SV:	Maria Tenqvist
Product specialist FI:	Heidi Vaarala
Product specialist DK:	Trine Pedersen
Internal expert (nano)	Terhi Uusitalo/nano group
Internal expert (raw materials)	Raw material group
Internal expert (packaging)	Rebecca Uggla
Product Development Manager	Karen Dahl Jensen (DK)

5 Environmental impact of cleaning products

This describes, from a life cycle perspective, which areas of a cleaning product are significant for health and the environment.

To achieve environmental gains, each individual requirement must be relevant. There must also be a proven potential to differentiate between the environmentally better products and others (there must be a difference and it has to be large enough that it “pays” to set the requirement). There must also be scope to steer the environmental problem in question via ecolabelling requirements.

These three parameters are to be seen together and as such are referred to as **R**elevance-**P**otential-**S**teerability, RPS. Choosing the requirements that together have the greatest relevance, potential and steerability in terms of the product’s life cycle achieves the greatest environmental gain.

Nordic Ecolabelling acknowledges that there are many actors in the cleaning product industry and that there are differences between the products that give those with well-advanced environmental work an advantage.

The task of the criteria is to reduce the potential environmental impact of the products.

The requirements are based to a large degree on the properties of the ingredients, which can be measured using recognised methods. The environmental impacts that have proven to be relevant can also be regulated using the requirements in the document, thus achieving steerability.

Appendices 1a and 1b provide two "MECO diagrams", summaries of the impact from a cleaning product's materials, energy, chemicals and other factors (such as waste, transport, etc.). MECO can be described as a "light" version of an LCA with a focus on materials, energy, chemicals and "other" – but the strongest focus in this MECO analysis has been on energy. It is important to note that there is no numerical factor for the environmental or health impact of the raw materials.

The MECO diagrams in the appendices are separated such that the concentrated products have one MECO table (appendix 1a) and the ready-to-use (RTU) products have another MECO table (appendix 1b). The purpose of this is to clarify that the two product categories are associated with slightly different problems.

The assumptions that have been made in the MECO diagrams are briefly described in the introduction to appendix 1c.

The MECO analysis was used to identify which areas pose the greatest environmental and health challenges for cleaning products, and therefore where it is most relevant to set requirements. The important parameters according to the MECO and life cycle analyses[18] are the extraction and production of raw materials (choice of surfactants), packaging (particularly for spray products), the use phase (energy use and water consumption), emission of chemicals in the use and waste phases (ecotoxicity and biodegradability) and transport (particularly for spray products). Dosing and performance affect all these parts of the life cycle. The impact in the different phases is described in more depth below using the RPS tool.

[18] GreenSeal: Amit Kapur, Cheryl Baldwina , Mary Swanson, Nana Wilberforce, Giovanna McClenachan, Mark Rentschler, Comparative Life Cycle Assessment of Conventional and Green Seal-Compliant Industrial and Institutional Cleaning Products, http://www.greenseal.org/Portals/0/Documents/Standards/GS-37%20LCA.pdf, Laura Golsteijn, Rimousky Menkveld, Henry King, Christine Schneider, Diederik Schowanek and Sascha Nissen, A compilation of life cycle studies for six household detergent product categories in Europe: the basis for product-specific A.I.S.E. Charter Advanced Sustainability Profiles, Environmental Sciences Europe – Bridging Science and Regulation at the Regional and European Level 2015 27:23, http://enveurope.springeropen.com/articles/10.1186/s12302-015-0055-4, 5 October 2015, AFISE : Association Française des Industries de la détergence, de l'entretien, de l'hygiène et des produits d'hygiène industrielle, COMPARATIVE LIFE CYCLE ASSESSMENT STUDY 3 CLEANING PRODUCTS FOR KITCHEN SURFACES FRENCH STUDY, http://docplayer.net/6306344-Comparative-life-cycle-assessment-study-3-cleaning-products-for-kitchen-surfaces.html, 2004
EDP of E' COSI' http://gryphon.environdec.com/data/files/6/9651/epd302it_ECosi_Detergents_2015.pdf, in search on "detergents" at http://www.environdec.com/en/EPD-Search/ (24.02.2017)

Relevance

Relevance is assessed based on which environmental problems the product group causes and how extensive those problems are.

Raw materials

Most of the raw materials in the cleaning product are organic substances. Both renewable and non-renewable organic raw materials are used, as well as raw materials that are synthesised from both renewable and non-renewable raw materials. In the long term there are limited amounts of non-renewable materials because they are extracted from fossil oil, while renewable raw materials are re-established through natural processes. The fact that renewable raw materials are re-established is an important argument for promoting the use of renewable raw materials, i.e. it is relevant to introduce requirements encouraging the use of renewable materials.

Surfactants are the largest raw material group in cleaning products. Inorganic raw materials are also used, e.g., salts, alkalis and mineral pigments, but with fewer variations and in smaller quantities.

Surfactants are made entirely from fossil raw materials, entirely from renewable raw materials, or a surfactant may contain both fossil and non-fossil raw materials. Renewable raw materials used in these surfactants include palm kernel oil, coconut oil and animal fat. Since many of these raw materials are problematic (see also section 3 Other labels and controls), they cannot be promoted without requiring them to be sustainably produced. 24% of the world's palm oil production goes into consumer products (such as cosmetics, candles and laundry detergents). According to AAK AB, palm oil and palm kernel oil are the main vegetable raw materials in the laundry detergent industry. BASF[19] says that palm kernel oil is one of the most important renewable raw materials. In 2013, palm oil accounted for a third of the global vegetable oil market. Palm oil will remain important in the future and, due to among other things that it has the richest yields of all the vegetable oil sources (yield is 4–9 times more productive than other vegetable oil sources).[20] It is therefore relevant to set requirements concerning the production of vegetable raw materials. In the future, the focus can shift towards other vegetable raw materials such as coconut oil, soya and sugar cane.

Manufacture of constituent substances and cleaning products

Manufacturing constituent substances and products consumes energy in the factories. Life cycle assessments of cleaning products show that the manufacture of the products is not responsible for the dominant environmental impact in the life cycle of the products.[21]

Even though the environmental impact from the manufacture of cleaning products is not the dominant environmental impact in the product's life cycle, it

[19] BASF, *Palm positioning*: https://www.basf.com/en/company/sustainability/responsible-partnering/palm-dialog.html, January 2016 (visited 22.05.2017)
[20] WWF: Palm oil – presentation in a seminar on palm oil and the cosmetics industry in Oslo in June 2016
[21] See previous references

can be considered relevant because cleaning products are manufactured in large quantities.

Raw material production appears to have a greater environmental impact, according to the LCAs (see previous references). Raw material producers state that the part of the product's life cycle that accounts for the greatest environmental impact differs from product to product based on the production processes (drying and fermenting, for example, require energy). There are several

LCA studies on the manufacture of certain raw materials[22] and the relevance varies depending on the raw material.

Packaging

Cleaning product packaging is relevant for its environmental impact. The amount of packaging material used for household chemicals is enormous, and the packaging can vary in size and in the quantity of material in relation to the content. An RTU product generally uses considerably more material for 1 litre of in-use solution, compared with concentrated products that are only diluted at the time of use. Professional cleaning products tend to have less packaging per litre of in-use solution, as they are usually sold in larger volumes per unit (everything from 1 litre up to 200 litres).

In addition, the EU has adopted an action plan on the circular economy[23] which has a clear focus on recovery and recycling, particularly with regard to packaging material.

For the aforementioned reasons, it is highly relevant to set packaging requirements.

Use phase

Large volumes of cleaning products are sold each year. Cleaning products are sold to both professional and consumers and the risk of over-dosing is greatest for the products that are sold as concentrates, where the user has to dilute them. Ready-to-use products have less risk of over-dosing since they are already diluted, but the risk with sprays, for example, is instead that users might spray more than they need onto the surface to be cleaned.

Correct dosing is highly relevant and it reduces the environmental impact of the product in every phase of the life cycle. Correct dosing means lower production, which in turn means reduced raw material extraction, and that lowers the amount of energy required to extract and process the raw materials, plus there is the bonus of cutting the use of packaging materials for the raw materials.

[22] E.g., *Letchumi Thannimalay and Sumiani Yusoff,* 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
[23] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 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

The energy used to heat the water for cleaning with concentrated products in the home is a factor in the environmental impact of such products. However, it is not a parameter that affects RTU products, since they are used without dilution in warm water. Concentrated cleaning products for professional use do not necessarily involve heating water, since the products are in many cases used in various types of cleaning machine[24] that do not involve heating water.

Health considerations are also important, since the products come into direct contact with the user during cleaning, and also when diluting concentrated products, for example, or spraying with RTU products, as these create a mist that can be inhaled into the lungs. Allergenic substances can be found in many cleaning products (e.g., fragrances and preservatives) and these products are a major concern for many consumers.

Waste phase

The key parameters for the constituent raw materials/chemicals are ecotoxicity and biodegradability, since cleaning products are washed away in wastewater after use and end up in the environment. Products that contain toxic raw materials cause more damage to the environment than those with less toxic raw materials.

It is therefore relevant to set requirements on the inherent characteristics of the substances included in the products, such as degradability and aquatic toxicity and to prohibit or reduce problematic substances such as environmentally hazardous fragrances.

Packaging naturally has a major impact on the waste phase. It is relevant for packaging to be recyclable in order to promote material recovery and the circular economy.

Transport

Transport can be an important parameter for both the raw materials and the finished products.[25] The end products are first transported from the factory to the store/point of sale and warehouse. The end user then also transports the product to their home or company. The total distances travelled can thus be considerable.

[24] personal contact
[25] GreenSeal: Amit Kapur, Cheryl Baldwina , Mary Swanson, Nana Wilberforce, Giovanna McClenachan, Mark Rentschler, Comparative Life Cycle Assessment of Conventional and Green Seal-Compliant Industrial and Institutional Cleaning Products, http://www.greenseal.org/Portals/0/Documents/Standards/GS-37%20LCA.pdf, Laura Golsteijn, Rimousky Menkveld, Henry King, Christine Schneider, Diederik Schowanek and Sascha Nissen, A compilation of life cycle studies for six household detergent product categories in Europe: the basis for product-specific A.I.S.E. Charter Advanced Sustainability Profiles, Environmental Sciences Europe – Bridging Science and Regulation at the Regional and European Level 2015 27:23, http://enveurope.springeropen.com/articles/10.1186/s12302-015-0055-4, 5 October 2015

Potential

Potential is assessed based on the potential environmental gains within the specific product group and for each area in the criteria where requirements are set.

Raw materials

The surfactants used in cleaning products are often substances such as soap and alcohol ethoxysulphates (AES). Alkyl sulphates (AS), alkyl polyglycosides (APG) and alcohol ethoxylates (AE) are also used in surfactants. Of these, APG and AES surfactants may derive entirely from renewable raw materials. It is thus possible to require a proportion of renewables in surfactants without any great need for reformulation of the product.

There is thus potential to promote renewable raw materials and to introduce requirements on renewable raw materials to ensure their origin and their sustainable cultivation. Systems such as RSPO for sustainable palm oil cultivation are currently available. The availability and traceability of sustainable alternatives remains limited, which slightly diminishes the potential at this point in time. Note that these systems do not fully meet Nordic Ecolabelling's requirement for sustainability certification, see also Raw materials labelling and traceability systems in section 3 Other labels and controls. Nordic Ecolabelling experiences a desire both from consumers and certain licence holders that Nordic Ecolabelling should broaden this area and consider introducing requirements for renewable raw materials.

Manufacture of constituent substances and cleaning products

Energy use and environmental impact from manufacturing are reduced by optimising processes and using renewable energy, for example, and there is potential to set requirements in this area. The choice of raw materials with less of an environmental impact in the manufacturing phase of the life cycle is also an area with a certain amount of potential.

Packaging

The manufacturers can choose for themselves what packaging they use for their products. There is therefore potential for Nordic Ecolabelling only to label those products whose packaging is most optimised in terms of its weight-utility ratio for cleaning products. For the same reason, there is also potential for requirements that promote the circular economy via a design that encourages recycling. The amount of recycled plastic used in packaging is still relatively small in the Nordic market. The potential for requiring a certain proportion of recycled plastic in packaging is thus rather modest, but it is growing and potential is also emerging in the form of new packaging solutions and uses of recycled materials.

Use phase

Better and more accurate dosing would reduce the quantities used. This can be helped by providing the consumer with clear instructions and by ensuring that

the products perform well at the recommended dose. There is thus potential to reduce volumes and encourage the correct dosing.

Although lowering the temperature of the water that is used in cleaning would also save energy, it is unlikely that people would do it. The potential is therefore low for energy savings.

On the health front, the various products on the market differ in their contents, so there is potential for improvement.

For spray products, there is potential to reduce the amount of hazardous substances that are inhaled into the lungs. It is possible to set limits on which chemicals may be used in the products, and to set a requirement that the products must generate less in the way of inhalable aerosols.

Waste phase

The products on the market differ in the ecotoxicity and biodegradability of their contents, so there is potential for improvement.

Since the packaging in question is plastic, there is potential to make packaging more suitable for material recovery, for example by prohibiting certain material combinations or black packaging that cause problems in the automated process of sorting plastics.

Transport

There is always potential to better organise logistics and switch to better vehicles.

Steerability

Steerability is assessed based on the scope to set requirements concerning the relevant environmental parameters with potential for improvement.

Raw materials

Promoting renewable raw materials in Nordic Swan Ecolabelled cleaning products requires that the production of renewable raw materials, and the production of vegetable oil in particular, is sustainable. RSPO[26] is one of the initiatives that seeks to promote the production of sustainably grown palm oil. However, the complexity of the production and delivery chain can make it difficult for smaller manufacturers in particular to fully trace their raw materials.

Nordic Ecolabelling considers that steerability of setting requirements on the origin of raw materials has had a positive development in recent years with regard to palm oil. Major actors in the market, manufacturers of cleaning products and raw materials producers alike, have stated that they will switch to

[26] http://www.rspo.org/

certified palm oil by 2020.[27] However, the complexity of the production and supply chain can make it difficult especially for smaller producers to have full traceability on their raw materials.

Other problematic vegetable raw materials such as soya and sugar cane also have certification systems.[28] These are used to a lesser extent than palm oil in cleaning products.

Although standards have their shortcomings, Nordic Ecolabelling considers that for the product groups where there are no alternatives and palm oil derivatives are used in large quantities, RSPO certification is a good start.

There is no such system for fossil raw materials and their origin is not steerable. There is, however, steerability with regard to limiting the quantity of fossil raw materials and we do this via our policy requirements.

There is EU legislation on animal fats: These are covered by EU Regulation 1774/2002 of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption, which ensures traceability to the point of origin of waste and residues.

Manufacture of constituent substances and the cleaning product

The manufacturers control their factories and it is therefore possible to set steerable general requirements concerning energy and water consumption in the manufacturing process. Nordic Swan Ecolabelled and non-Swan Ecolabelled products are, however, manufactured on the same line and it would therefore be impossible to tie the requirement solely to the Nordic Swan Ecolabelled products.

Quality procedures can safeguard good quality. Requirements on pollutants ensure purer constituent substances. These are steerable requirements.

Nordic Ecolabelling's requirements concerning the manufacture of raw materials would offer less steerability, since our licence holders do not own the manufacturing process. Good, credible databases of life cycle data on raw material manufacture could, in the future, provide a way to steer manufacturers towards raw materials with less of an environmental impact. However, such databases do not exist at this time.

Packaging

When it comes to packaging, Nordic Ecolabelling believes it is possible to steer manufacturers toward packaging with less of an environmental impact through a WUR (weight-utility ratio) requirement, since the manufacturers are free to choose which packaging they use. Steerability thus also exists in other requirements that promote recycling of packaging and the circular economy.

[27] e.g., Unilever: https://www.unilever.com/sustainable-living/reducing-environmental-impact/sustainable-sourcing/transforming-the-palm-oil-industry/ (23.05.2017), Henkel: http://sustainabilityreport.henkel.com/product-stewardship/raw-materials/ (23.05.2017), BASF: https://www.basf.com/en/company/sustainability/responsible-partnering/palm-dialog.html, January 2016 (visited 22.05.2017)
[28] Bonsucro: https://www.bonsucro.com (23.05.2017) RTRS: http://www.responsiblesoy.org/?lang=en (23.05.2017)

Refills for all RTU products would be desirable from a packaging perspective as a way to reduce the amount of packaging material. But, since it is difficult for the product manufacturers (who tend to be the licence applicants) to control the scale of refill sales in stores, there is little steerability over refills.

Use phase

It is very difficult to control what the users do when cleaning, in terms of both dosing and water consumption. Nordic Ecolabelling has requirements concerning user instructions and performance as a way to steer users towards more correct use of the products.

There is less of an over-dosing problem with RTU products and wipes, since they are easier to dose correctly. There are thus advantages to such products.

In terms of health, manufacturers have major influence over the raw materials that are added to the products and they are aware of the health effects of the raw materials. There are thus excellent opportunities to set fully steerable health requirements for the constituent raw materials.

The manufacturers of spray products also have considerable influence over the choice of packaging. There are thus also excellent opportunities to set fully steerable requirements concerning the use of spray nozzles that reduce the formation of inhalable aerosols.

Waste phase

The manufacturers have major influence over the raw materials that are added to the products and they are aware of the health effects of the raw materials. There are thus excellent opportunities to set fully steerable requirements concerning the ecotoxicity and biodegradability of the constituent raw materials.

As mentioned in the packaging section above, there is scope to steer manufacturers towards packaging that is better suited to material recovery, since the manufacturers have the freedom to choose their packaging.

Transport

Steerability is low in this area, since Nordic Ecolabelling has little scope to influence the transport used by raw material manufacturers and manufacturers of cleaning products. This is because the licence holders do not usually own the distribution systems they use.

6 Justification of the requirements

6.1 Definition of the product group

The criteria apply in the first instance to general cleaning and not specialist cleaning products.

Cleaning products designed to clean fixed, hard surfaces (floors, walls, countertops, windows etc.) in the form of concentrated products and RTU (Ready-

to-use) products. Spray products can only be Nordic Swan Ecolabelled if they have a permanently mounted foam nozzle, see requirement O29.

Products for cleaning of textile flooring can only be Nordic Swan Ecolabelled if they are in the form of concentrated products to be diluted prior to use.

The product group has been extended to include cleaners for textile floors and outdoor products for cleaning facades and terraces in this generation.

Cleaning products for textile floors was added to this generation after the public hearing, since there were comments asking for the Nordic Ecolabelling to evaluate the possibility to label such products. There seems to be environmentally differences between the products within this category, such as preservatives, surfactants etc. Textile floors are growing in open office areas and therefore there is also a desire to Nordic Swan Ecolabel such cleaning products. Textile floor cleaners are in these criteria document a subgroup under concentrated professional products, i.e. products intended to be diluted prior to use. The products are to fulfil the requirements in the same way as other professional products. A new performance test instruction has been added to the criteria document to fit the usage of this product type.

Cleaning products for outdoor applications such as facade cleaners and terrace cleaners have been added as a new product type, since there has been interest on Nordic Swan Ecolabelling of such products from the market. The Nordic Ecolabel can see the possibilities to only label the environmentally best products within this category. The products need to fulfil all the requirements in the criteria document (see requirement limits called “Terrace and facade cleaners”) as well as a new performance test for this type of products.

The product group encompasses cleaning products intended for indoor, general and regular cleaning of:

- fixed surfaces (floors, walls, ceilings, doors and tiles.
- kitchen equipment (for example work surfaces, kitchen cabinets, stoves, ovens)
- sanitary installations (for example WCs, baths, showers, wash basins, mirrors and cabinets)
- Windows (inside and outside)
- Textile flooring, such as carpeted floors
- Wash polish/wash-and-wax care products

The product group also includes the following types of cleaning products for outdoor usage:

- Facade cleaning
- Patio/terrace cleaning

Concentrated products for the professional market containing microorganisms are also included in the product group, but only for indoor use.

Products for the professional market (products are considered professional if more than 80% of sales are to the professional market) and/or consumer products can be labelled.

Sub-categories

The product group is divided into subgroups, which also can be found under requirements where there are several different requirement levels.

Concentrated, professional: This category includes professional products that require dilution with water prior to use. It contains products for all the aforementioned surfaces, such as floors, walls, ceilings, kitchen work surfaces, tiles, WCs, bathtubs and showers. Chemical products for cleaning of textile flooring is also included in this sub-category. Tablets/capsules/granulates are included in this category.

Tablets/capsules/granulates are included in this category.

RTU (Ready-to-use), professional (other except windows): Professional products that are pre-diluted and ready for use including foam products. This category includes products for WCs, kitchens, oven, bathtubs, showers, windows and so on, but not for large areas* such as floors. Please note requirement O29 regarding foaming nozzles.

RTU, window cleaner, consumer and professional: Professional window and glass cleaners that are pre-diluted and ready for use straight from the package including foam products.

Concentrated, consumer: Concentrated products that require dilution with water prior to use and are designed for the consumer market. This category contains products for all the aforementioned surfaces in the home, such as floors, walls, ceilings, windows (inside and outside), kitchen work surfaces, tiles, WCs, bathtubs and showers. Tablets/capsules for WCs are included in this category. Wash polish/wash-and-wax care products for consumer use are also included.

RTU, WC, consumer: Consumer WC cleaners that are pre-diluted and ready for use straight from the package. This category only includes products for use on WCs and excludes cleaners for other sanitary porcelain and bathroom cleaners.

RTU, consumer (other except windows and WC): Pre-diluted consumer products that are
ready to use without dilution. This includes products for kitchens, ovens, bathtubs, showers and so on, but not for large areas* such as floors. Please note requirement O29 regarding foaming nozzles.

**The term "large areas" refers to areas such as floors and tiled bathroom walls. RTU products shall be intended for use on smaller surfaces and "spot cleaning".*

Concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water can be Nordic Ecolabelled together with the RTU product. The product may be e.g., a vial or a tablet. The common thing is that the product is diluted up to 100 times to a use solution in a bottle and that the person handling the concentrated

products does not run the risk of coming into contact with the product when it is diluted to the finished product.

Wash polish/wash-and-wax care products: combined cleaning and polish improvers. They contain care products: film-forming components such as polymers, resin and/or wax. Wash-and-wax care products here are concentrated products diluted prior to use.

Facade and patio/terrace cleaning concentrate: Products intended for cleaning outside such as cleaning facades, patios and terraces.

Concentrated products that can be used both in a diluted state, such as diluted in a bucket of water, and in a more concentrated state, such as diluted with a small quantity of water for use in a foam bottle, must fulfil the requirements for both concentrated (diluted in bucket) and RTU (spray bottle) products.

Products that are sold on both professional and consumer markets must fulfil the requirements for professional products.

Products designed for several areas of use, such as WC and bathroom cleaner (walls, floor and so on), must fulfil the requirements of each applicable category.

Ready-to-use products

Nordic Ecolabelling conducted an internal survey of the use of ready-to-use products in 2011. This followed the introduction of less stringent requirements for RTU products than for concentrated products for the same areas of use, and generally less stringent requirements for consumer products than for products for professional users.

The conclusion of the survey was that RTU and concentrated products are used differently. The survey suggests that professional concentrated products are used for larger surfaces and the dosing is either via a dosing system or using scoops. Consumers, on the other hand, are more likely to use a vacuum cleaner on large surfaces, which they then occasionally clean using concentrated products. RTU products are used primarily on small surfaces, for example in the bathroom and kitchen, and on windows, while concentrated products are diluted and used on large surfaces such as floors.

The main advantage of RTU products is that the user has the “correct dosing” from the start and does not need to mix up a in-use solution. This can be compared with concentrated products, where the user is responsible for adding the right amount of concentrate to a stated amount of water. Another advantage is that only the amount required at the time is actually used (although it is possible to over-dose by spraying too much), in contrast to diluting an amount of concentrate in a bucket of water, using just half of if, and discarding the rest after use.

The main disadvantages of RTU are the unnecessary transport of water and the health impact. The health aspect relates primarily to RTU products in sprays, as exposure to a spray mist is very different to the exposure that occurs when diluting concentrate in a bucket. RTU sprays also tend to be used in small rooms,

such as bathrooms, which exposes the user even more and increases the risk of breathing in the spray mist and its contents. The criteria have been updated to exclude regular spray products from the product group definition. Only sprays with a foamer mesh (or equivalent aerosol-reducing device) are included. See separate requirement about this in the Packaging section of the requirements.

There is a large market for RTU products, particularly in the consumer market. If Nordic Ecolabelling opted not to label any such products, this would exclude a relatively large portion of the market, which would reduce the overall environmental gains achieved by the criteria for cleaning products. The requirements set for the RTU products are strict, particularly with regard to allergens, packaging and CDV (critical dilution volume), in order to ensure that only the products with the best health and environmental credentials meet the Nordic Swan Ecolabel criteria.

In February 2020 Nordic Ecolabelling decided to adjust requirements so that it was specified that concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water can be Nordic Ecolabelled together with the finished product as such refills save a lot of packaging material and also transport and therefore brings environmental benefits. At the same time, some requirements have been adjusted to clarify how these products should be handled.

The MECO analysis and a life cycle analysis have identified transport as one of the important parameters regarding the environmental impact of a detergent. Furthermore, it is stated that the steerability over transport is low since the license holder's steerability is low due to that they rarely own the system or systems that they use to transport their products, but that the Swan "can influence it indirectly by favouring concentrated products, leading to less water transport".

Such refills are diluted 10-100 times with water to the solution for use by the end-user, which enables us to steer towards a lower climate impact from the transport of the cleaning product. Carbon dioxide emissions from transport should be significantly reduced as the volume of water transported is reduced by up to 99 % compared to an RTU product.

Furthermore, overdose is a major reason why unnecessary chemicals are released into our environment. Overdose affects all phases of the life cycle (energy use in manufacturing, transport, packaging, etc.), which can be avoided when using refill vials. Using a refill provides a more accurate dosage compared to a conventional concentrated product where the customer himself determines the amount of concentrate that is diluted.

Products which cannot be Nordic Swan Ecolabelled as cleaning products

During the revision, 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 criteria for the Nordic Swan Ecolabelling of cosmetics. There are also wipes for cleaning fixed surfaces, and

these are known as cleaning wipes. Cleaning wipes can be found on both the professional and the consumer markets. On the consumer front, there are wipes for the kitchen, bathroom, WC, windows and floors. On the professional market, there are wipes for cleaning surfaces in catering kitchens, restaurants, bars, hotels and so on. There are also some wipes that kill bacteria, for use in hospitals and similar contexts.

The use of cleaning wipes has risen in recent years, globally and in the Nordic region.[29] Their share of the consumer market in the Nordics is estimated to be 10–15%.

Nordic Ecolabelling has analysed five LCA studies with slightly different aims. The studies cover both cleaning wipes and baby wipes.[30]

It was often unclear which product/method was the best. It was apparent in all the studies, however, that the wipe material had the greatest environmental impact in the life cycle of wipes.

Since the wipe material has the greatest environmental impact, and it cannot be sent for material recovery, Nordic Ecolabelling has decided not to expand the product group to include wipes in generation 6. Nordic Ecolabelling does not wish to promote a product that cannot be recycled, and that risks being thrown down the toilet, in an area where there are perfectly good alternative solutions. Disposable wet wipes are not compatible with the circular economy in the opinion of Nordic Ecolabelling.

The cleaning products below are not included in these criteria, since the criteria are aimed at more general and regular cleaning, which excludes specialist products such as drain cleaners or cleaners for refrigerated rooms.

Cleaning products intended for 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
- cleaning wipes
- floor wax and floor polish without cleaning effect

[29] Presentation at Go Wipes Conference, Smithers-Pira, Global Overview of the Wipes Market, 14.11.2016 and personal communication with wipe manufacturers in the Nordic countries.
[30] AFISE, December 2004 http://docplayer.net/6306344-Comparative-life-cycle-assessment-study-3-cleaning-products-for-kitchen-surfaces.html; EDANA/Institut für Energie- und Umweltforschung Heidelberg GmbH, 2011, http://www.edana.org/docs/default-source/default-document-library/lca-for-baby-wet-wipes---3.pdf; Gert Van Hoof et al. Assessment of Progressive Product Innovation on Key Environmental Indicators: Pampers® Baby Wipes from 2007–2013 *Sustainability* **2014**, *6*, 5129-5142doi:10.3390/su6085129; The other two studies have not been published, material received from stakeholders

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

6.2 General requirements

Requirements O1–O4 and O26–O36 are for all products.

In section 2.1 are requirements, O5–O15, for all cleaning products except wash polish/wash-and-wax care products.

In section 2.2 are requirements, O16–O26, for wash polish/wash-and-wax products.

The definition of constituent substances is included to explain what is meant by constituent substances and impurities. The requirement has been changed compared with the previous generation of the criteria. The aim has been to make the criteria easier to understand.

Definition

The requirements in the criteria document and accompanying appendices apply to all ingoing substances in the Nordic Swan Ecolabelled product. Impurities are not regarded as ingoing substances and are exempt from the requirements.

Ingoing substances and impurities are defined below, unless stated otherwise in the requirements

- Ingoing substances: all substances in the Nordic Swan Ecolabelled product, including additives (e.g., preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g., formaldehyde, arylamine, in situ-generated preservatives) are also regarded as ingoing substances.
- Impurities: residuals, pollutants, contaminants etc. from production, incl. production of raw materials that remain in the raw material/ingredient and/or in the in the Nordic Swan Ecolabelled product in concentrations <100 ppm (<0,0100 weight percent, <100,0 mg/kg)
- Impurities in the raw materials exceeding concentrations of ≥ 10 000 ppm (≥1,000 weight percent, ≥ 10 000 mg/kg) are always regarded as ingoing substances, regardless of the concentration in the Nordic Swan Ecolabelled product.

Examples of impurities are residues of the following: residues or reagents incl. residues of monomers, catalysts, by-products, scavengers, and detergents for production equipment and carry-over from other or previous production lines.

Foil that is not removed before use of the product is considered as part of the formulation/recipe.

O1 Description of the product

The applicant must give detailed information on the cleaning product to which the application relates. The following information is required:

- Description of the product, including its area of use, in accordance with "What can carry the Nordic Swan Ecolabel?" (consumer/professional product, RTU* or concentrated, and so on)

** Note that RTU products are not intended to be used on large surfaces such as floors or larger bathroom surfaces such as tiled walls. RTU products are to be intended for use for smaller surfaces and "spot-cleaning". RTU products in spray application have to have a mounted foaming nozzle, see requirement O29. The products are referred to as foam/spray products.*

- User instructions that clearly explain how the product should be used.
- If the product is designed to be diluted before use, the recommended dose for normal soiling/normal use must be stated clearly and simply on the label/packaging and in the technical product data sheet
    - For consumer products, the dosing must be stated as x number of millilitres to y litres of water or as z number of caps to y litres of water.
    - For products intended for professional use, the dosing may, for example, be stated as x ml or an equivalent y pumps or similar per z litre of water. The information sheet or technical data sheet must include a recommendation on dosing equipment (e.g., pump, measuring vessel, pipette or similar).
- A complete formulation for the product. The formulation must for each ingoing raw material include:
    - Trade name
    - Chemical name for the main component, and, if relevant, additives (e.g., colorants, preservatives and stabilizers)
    - Amount (both with and without solvents, e.g., water)
    - CAS no. / EC no.
    - Function
    - A safety data sheet for each ingoing raw material
    - DID no. for substances that can be placed in the DID list

** The DID number is an ingredient's number on the DID list, version 2016 or later, which is used in calculating chemical requirements. The DID list can be obtained from Nordic Ecolabelling's websites, see addresses on page 2.*

☒ Description of the product in accordance with "What can carry the Nordic Swan Ecolabel?", e.g., label or other documentation. Label and product data sheet (if available) that includes dosing and user instructions. The information on labels and/or product data sheets must be in the languages in which the product is marketed.

☒ A complete formulation in line with the requirement. Nordic Swan Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites.

☒ Safety data sheets for each ingredient in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/E2EC).

Background to requirement O1

A description of the product (e.g., label) and its areas of use is required, in order 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 areas of use and for use in different ways (with and without

dilution), 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. Cleaning companies have brought this need to the attention of Nordic Ecolabelling.

Nordic Ecolabelling needs to know the complete formulation, with all constituent substances. This is necessary in order to check the individual requirements below and make the calculations necessary in respect of each requirement.

The safety data sheets must be updated in line with European legislation, which at the time of writing the criteria (May 2017) means compliance with Appendix II of REACH (Regulation (EC) No 1907/2006 as amended by Regulation (EU) 215/830).

The product group definition states that RTU products should be intended for usage on small surfaces and spot cleaning and not intended for large surfaces such as floors. This has now been added to this requirement to clarify what type of products that the product group encompasses. The reasons not to label ready to use products for large surfaces is the unnecessary transport of water with such products and the extra amount of packaging materials required for one dose of an RTU product compared to concentrated products.

A new requirement has been added to this criteria generation regarding foam nozzles on spray bottles. All spray products need to have a mounted foam nozzle to reduce the amounts of aerosols that regular sprays produce, see more under O29.

The requirement has been adjusted slightly compared with the previous version of the criteria and three requirements (R1, R2 and R21) have been merged.

6.3 Sustainable raw materials

O2 Sustainable raw materials

1. The licence holder must document that they are working to increase their purchasing of sustainable and renewable raw materials or that they require their manufacturer to work on increasing their purchasing of sustainable renewable raw materials for Nordic Swan Ecolabelled cleaning products. This can for example be done by promoting certified raw materials, by avoiding problematic raw materials or by changing from fossil based raw materials to sustainable raw materials. The targets must be quantitative and time-based, and they must be set by the company's management.

Renewable raw materials are defined as raw materials from biological material which are continuously renewed in nature within a short time span, for example grain and wood (European standard EN16575:2014).

2. The following data is required for each organic raw material/ingredient in the Nordic Swan Ecolabelled cleaning product:
   a) The proportion of the raw material/constituent part of the raw material/ingredient that comprises renewable raw material or originates from renewable raw material, calculated on an annual basis.

      The calculation of the proportion of the renewable material can be done using the following formula:

      Used amount renewable material / (used amount renewable material + used amount non-renewable material) x 100%

      Amounts in kg, molar weight or carbon atoms can be used in the calculation. Average carbon chain lengths can be used.

   b) What does the renewable raw material consist of (e.g., palm oil, coconut oil, grape seed oil, beeswax)?

   c) Does the renewable raw material have any sustainability certification? If yes, state which and at what level of traceability (No Traceability, Identity Preserved, Segregated, Mass Balance, Book & Claim)?

✉ 1. Policy or equivalent documentation of the licence holders work for renewable and sustainable materials in Nordic Swan Ecolabelled products, including quantitative, time-based targets.

✉ 2. Appendix 3 from the raw material supplier.

Background to requirement O2

Cleaning products use constituent substances from both renewable and non-renewable organic raw materials. Renewable raw materials are defined as raw materials from biological material which are continuously renewed in nature within a short time span, for example grain and wood (European standard EN16575:2014).[31] If needed this can be measured with the Carbon 14 method, ASTM D6866.

Renewable raw materials are defined here as both vegetable raw materials and animal raw materials. This includes for example palm oil, coconut oil, rapeseed oil and beeswax. In addition, there are minerals as parts of organic raw materials, and e.g., in pigments. There are limited amounts of non-renewable organic raw materials because they tend to be extracted from fossil oil, which is non-renewable.

The renewable base materials used in cleaning products are usually various oils and fats, which are subsequently turned into e.g., surfactants and emulsifiers.

The requirement on sustainable raw material procurement is similar to the requirement in the generation 3 of the Nordic Ecolabelling criteria for Cosmetics, adopted in November 2016. The revision of the criteria for Cosmetics in 2016, showed that setting an absolute requirement concerning the proportion of sustainable renewable raw materials was too early but that a requirement on sustainable renewable raw materials is important. All licence holders are

[31] https://biobs.jrc.ec.europa.eu/sites/default/files/generated/files/policy/CEN%20Bio-Based%20Definitions%20EN16575.pdf (visited 11.10.2016)

compelled to focus on their raw material choices by the requirement to work towards increasing renewable and sustainable raw materials in their production, and to list all the raw materials, their renewable sources and any certification. The manufacturers are now required to set more concrete, measurable and time-based targets concerning their purchasing of sustainable raw materials. This can be done, for example, by promoting certified raw materials or by avoiding problematic materials or by changing from fossil raw materials to sustainable renewable raw materials. The requirement is written so that the policy required is on the Nordic Swan Ecolabelled products and not on the entire company, since the Nordic Swan Ecolabel is a product label, i.e. not labelling entire companies. The Nordic Ecolabel may however acknowledge the policy on a company level. The goal of the requirement is to give the cleaning product manufacturers more of a focus on the origin of the raw material and associated certification schemes and that it sharpens their focus on renewable raw materials when they are selecting and purchasing raw materials in their everyday operations. For each individual raw material, the cleaning product manufacturers must document the origin, the certification scheme and the amount of the raw material in the product formulation. The knowledge that Nordic Ecolabelling acquires via this documentation will, in the long term, make it possible to set specific requirements concerning the content of renewable raw materials in Nordic Swan Ecolabelled cleaning products. At the same time, the cleaning product manufacturers gain an overview of all the raw materials in their Nordic Swan Ecolabelled formulations, so they can quickly see how much needs to be changed, when specific requirements concerning renewable raw materials are introduced. As the cleaning product manufacturers increase their focus on the origin of the raw materials and the certification schemes, they will immediately begin to consider renewable raw materials as alternatives to the traditional/usual raw materials. Chemicals suppliers will then need to offer more renewable and certified raw materials. It is therefore expected that the proportion of renewable raw materials in Nordic Swan Ecolabelled cleaning products will continue to increase during the lifetime of the criteria.

The requirement text states that the cleaning product licence holder must work to increase its purchasing of renewable and sustainable raw materials. If, however, a licence holder already uses a high level of renewable and sustainable raw materials in the Nordic Swan Ecolabelled products, that manufacturer does not have to set high ambitions to be even better.

O3 Certified raw materials from oil palms

Palm oil, palm kernel oil and palm oil derivatives must be certified according to RSPO. Mass Balance, Segregated or Identity Preserved are accepted as traceability systems.

The requirement does not include raw materials < 1% in the final product.

For concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water the limit of 1 % applies for the diluted final product.

✉ Information from råvaruproducenten wheher palm oil, palm kernel oil or palm oil or palm kernel oil derivatives are included in the raw material, Appendix 3 can be used.

✉ A valid RSPO CoC certificate

✉ The producer of raw materials or the producer of the Nordic Swan Ecolabelled product must show by means of a balance calculation and/or invoices/delivery notes that the proportion of certified raw material corresponds to the amount of certified palm oil raw materials. Alternatively, a declaration from the producer of raw materials that all purchased palm oil raw materials are certified

Background to requirement O3

In addition to the policy requirement on sustainable raw material purchasing (O3), Nordic Ecolabelling also sets requirements concerning the production of the palm oil that is used in raw materials for cleaning products.

Oil palms are a very common source of raw material, in the form of palm oil, palm kernel oil and their derivatives. One way to reduce the negative effects of the increasing use of palm oil products (e.g., rain forest destruction and unsustainable farming) is to increase the proportion of certified sustainable crops.

The most widely used certification system for palm oil is Round Table on Sustainable Palm Oil (RSPO). Nordic Ecolabelling has judged RSPO's standard for sustainable palm oil production and considers it not to meet Nordic Ecolabelling's requirements for sustainability labels. In product groups where there are no alternatives and no steerability for Nordic Ecolabelling to avoid palm oil, Nordic Ecolabelling sets as stringent requirements as possible. This means requirements on RSPO certified raw materials, with its associated traceability systems. Sustainability standards also exist for other potentially problematic vegetable raw materials such as soya or sugar. These raw materials are not used as widely in cleaning products. Coconut is widely used but is not yet subject to sustainability standards. Animal fat is used in small amounts and use is restricted by EU legislation (1774/2002).

Palm oil is difficult to avoid in cleaning products. The complexity of the production and delivery chain makes it difficult for smaller manufacturers in particular to fully trace their raw materials. There is, however, good evidence that the potential is increasing: for example, BASF stated at the Sustainable Cosmetics Summit in 2015[32] that they are very close to attaining their target[33] for all the palm kernel oil they buy to come from RSPO certified production. Norwegian and Swedish chemical industry associations have also published initiatives on the use of palm oil in their products, with the participants in the initiative undertaking to ensure that at least 90% of the palm oil used will be sustainably produced by the year 2020.[34]

[32] (BASF, 2015)
[33] BASF, *Palm positioning*: https://www.basf.com/en/company/sustainability/responsible-partnering/palm-dialog.html, January 2016 (visited 22.05.2017)
[34] KoHF – Kosmetik- och hygienföretagen, Initiativ för hållbar palmolja i kemisk-tekniska produkter, 1 October 2015, https://www.kohf.se/nyheter2/2015/10/01/vi-tar-initiativ-for-hallbar-palmolja-i-kemisk-tekniska-produkter?rq=palmolja Vaskemiddelleverandørenes Forening (VLF) och Kosmetikkleverandørenes forening (KLF), Norsk initiativ om bruk av bærekraftig palmeolje i kosmetikk og vaskemidler, 1 June 2017

Other ecolabels such as the EU Ecolabel[35], Bra Miljöval[36] and Australia's Good Environmental Choice[37] set ambitious requirements on the proportion of sustainable palm oil and palm kernel oil derivatives in cleaning products. GECA sets a requirement that at least 20% of the palm oil must be certified in line with RSPO Mass Balance or equivalent and the remainder must be Book & Claim certified. In the proposal that it sent out for consultation (dated 17 May 2017) Bra Miljöval has a requirement that the company's senior management team must have adopted a policy or equivalent to increase the proportion of renewable raw materials over time and that the transition to renewable raw materials must take place in a way that is socially and environmentally sustainable. The licence holder must also know about the proportion of renewable raw materials in each ingredient. Bra Miljöval sets even requirements that non-chemically modified oils, fats and other substances from oil palms must come from organic production and all other palm oil in ingredients must be certified in accordance with RSPO Mass Balance, Segregated or Identity Preserved. The EU Ecolabel requires all the palm oil in products to have RSPO or equivalent certification at Mass Balance level or better and all palm oil derivatives must have RSPO or equivalent certification at Book & Claim level.

A limit stating that raw materials < 1% in the final product does not have to fulfil the requirement. This means that if for example palm oil is included in perfume, colorant or preservatives does not have to be documented in this requirement. But the main types of raw materials, such as surfactants, are covered by the requirement.

O4 Surfactants – aerobically and anaerobically biodegradable

a) All surfactants must be easily biodegradable according to test method no. 301 A–F in the OECD guidelines for testing of chemicals or other equivalent testing methods evaluated by an independent body and controlled by Nordic Ecolabelling.

b) All surfactants must be anaerobically biodegradable in accordance with ISO 11734, ECETOC no. 28, OECD 311 or equivalent testing methods evaluated by an independent body and controlled by Nordic Ecolabelling.

✉ Reference to the DID list dated 2016 or later versions.

✉ If the DID list lacks the relevant data for surfactants, data may be taken from the safety data sheet on condition that the data is reliable and that the test methods are in agreement with Appendix 1. Section B of the DID list shows how to make the calculations of the various factors. It is also permitted to refer to analogous observations, as long as they are carried out by a competent, independent third party, and refer to relevant data from literature that has been subject to scientific scrutiny.

[35] EU Ecolabel, COMMISSION DECISION establishing the EU Ecolabel criteria for hard surface cleaning products,
25 Nov 2016,
http://ec.europa.eu/transparency/regcomitology/index.cfm?do=search.documentdetail&dos_id=0&ds_id=48133&version=2

[36] Swedish Society for Nature Conservation, Remissversion för kriterier Bra Miljöval Kemiska produkter 2017:X http://www.naturskyddsforeningen.se/sites/default/files/dokument-media/kriterier_kemiska_produkter_170515.pdf

[37] Good Environmental Choice Australia, Environmental Performance Standard Cleaning Products, Standard No: CPv2.2i-2012 Issued: 9 July 2014
http://www.geca.org.au/media/medialibrary/2016/07/Cleaning_Products_CPv2.2i-2012_1.pdf

Background to requirement O4

Surfactants are widely used in cleaning products and constitute a large proportion of the chemicals in such products.

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. Surfactants are considered to be key 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 Detergent Regulation requires surfactants to be aerobically degradable.

The detergent regulation prescribes that surfactants must be aerobically biodegradable, but there are opportunities for exemptions from the detergent regulation for products for professional use. This possibility has so far been used only once in the EU[38], for a surfactant that can be used in CIP products. Since the possibility exists, we believe it is appropriate to retain the requirement of aerobic biodegradability of surfactants It is therefore very important to require surfactants (irrespective of function) to be biodegradable in both aerobic and anaerobic conditions for this product group.

Linear alkylbenzene sulphonate (**LAS**) is toxic to aquatic organisms and not anaerobically biodegradable. As a surfactant, LAS is excluded from use by the requirement concerning non-anaerobically biodegradable surfactants (O13).

Alkylphenol ethoxylates (**APEO**) and/or alkylphenol derivatives (**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, but they are still explicitly prohibited in O5.

In the latest version of the EU Ecolabel's criteria for cleaning products (adopted on 23 June 2017), only surfactants classed as H400 or H412 must be anaerobically biodegradable. Instead there is a limit for the total quantity of non-anaerobically biodegradable surfactants. Nordic Ecolabelling has not identified sufficient environmental gains to justify removing the requirement concerning anaerobically biodegradable surfactants and has chosen instead to retain the requirement. The requirement is the same as in generation 5 of the criteria.

6.4 Product specific requirements (section 2.1 in the criteria document)

In section 2.1 are requirements, O5-O15, for all cleaning products except wash polish/wash-and-wax products. In section 2.2 are requirements, O16-O26, for wash polish/wash-and-wax products.

All products need to fulfil requirements O26-O36

[38] Bilaga V i detergentförordning 648/2004, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2004R0648:20120419:sv:PDF

O5 Classification of the product

The product must not be classified as shown in Table O5. The requirement applies to all products, including concentrated products for refill for RTU bottles in concentrated form.

Tabell O5 Classification of the product

CLP Regulation 1272/2008		
Classification	**Hazard Class and Category Code**	**Hazard statement**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Aquatic Chronic 3 Aquatic Chronic 4	H400 H410 H411 H412 H413
Hazardous to the ozone layer	Ozone	H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3 Acute Tox 4 Acute Tox 4 Acute Tox 4 Exception: Professional products can be labelled with Acute toxicity, Category 4 with H332, H312, H302 if the packaging is designed so that the user does not come in contact with the product	H300 H310 H330 H301 H311 H331 H302 H312 H332
Specific target organ toxicity, single or repeated exposure	STOT SE 1 STOT SE 2 STOT RE 1 STOT RE 2	H370 H371 H372 H373
Skin corrosion/irritation	Skin Corr. 1A, 1B or 1C Exceptions: - Professional products where classification is due to pH. - WC-products for consumers where the classification is due to pH.	H314
Aspiration hazard	Asp. Tox. 1	H304
Respiratory or skin sensitisation	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317 Products labelled with EUH208: “Contains (name of sensitising substance). May cause an allergic reaction.”**

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

** *Concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water are exempted if the user does not come in contact with the product when diluting.*

Please note that the producer/supplier is responsible for the classification.

☒ Safety data sheets for the product in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/E2EC).

☒ Description of the packaging design showing that the user is not in contact with the product for the professional products for which an exemption is made from the requirement of classification as H332, H312 and/or H302 and for concentrated products for refill for RTU bottles for which an exemption is made from labelling with EUH208. Documentation in the form of a technical description and user instructions showing how the user avoids contact with the product.

☒ Documentation confirming that the product (professional products and WC products for consumers) has been classified as corrosive due to its pH value, if an exemption is made for H314.

Background to requirement O5

Nordic Ecolabelling sets requirements concerning environmental and health classification of products, to ensure that products that are toxic or harmful to the environment and health cannot be Nordic Swan Ecolabelled.

The classification of acute toxicity or organ toxicity has been included so as to close the door on products with such a classification. Nordic Ecolabelling does not believe that there is any great risk of products with such classifications entering the market but has still opted to retain the requirement.

By including requirements stating that substances categorised by specific inherent properties must not be used in ecolabelled products, the ecolabelling can meet concerns regarding safe use of specific chemicals and thus highlight environmental and/or consumer issues. See also requirement O4. Excluding CMR substances is an important parameter from a health perspective, which is why substances classified as CMR are also excluded at raw material level (see requirement O3). For communication reasons, however, the requirement is also retained at product level.

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, thus minimising the risk of 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.

In the earlier generation of the criteria document there was a ban on spray products classified with H318 (risk for serious eye damage). The reason for classifying products with H318 is mainly due to the ingoing surfactants. It may therefore be difficult to formulate products performing well without being classified as H318. In this criteria generation regular spray products cannot be Nordic Swan Ecolabelled unless they have an aerosol reducing foaming nozzle. It is with foam products not very likely that a foam/spray product will end up in the

eyes and cause eye damage, so the Nordic Ecolabelling has chosen to remove the restriction on H318 which is a change compared to generation 5.

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 in order to allow the ecolabelling of highly concentrated products and products intended for areas of use where extreme pH values are required in order 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.

Products must also not be classified as sensitising or carry the label "Contains (name of sensitising substance). May cause an allergic reaction."

By including requirements stating that substances categorised by specific inherent properties must not be used in ecolabelled products, Nordic Ecolabelling can meet concerns regarding safe use of specific chemicals and thus highlight environmental and/or consumer issues. See also requirement O5.

The general requirements also apply to refills for foam/spray products in concentrated form, since refills are sold as concentrates and so the classification regulation (CLP) relates to the concentrated form. Consumers are also exposed to the product in concentrated form, when a foam is diluted from concentrate. However, the specific requirements for foam/spray products only apply to foam/spray products in a in-use solution.

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

The ban on H420 (Hazardous to the ozone layer) has also been added since the last generation. Nordic Ecolabelling does not believe there is any great risk of products with H420 entering the market but has chosen to introduce the requirement to emphasise that no form of environmental hazard classification is permitted.

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

6.4.1 Requirements for constituent substances

O6 Classification of ingoing substances

Ingoing substances in the product must not be classified as shown in Table O6:

Table O6 Classification of ingoing substances

CLP Regulation 1272/2008:		
Classification	**Hazard Class and Category Code**	**Hazard statement**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351**
Mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact	H360 H361 H362

Respiratory or skin sensitisation***	Resp. Sens. 1 Skin Sens. 1	H334 H317

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

** Exceptions: Complexing agents of the MGDA and GLDA type may contain NTA impurities in the raw material in concentrations of less than 0.2%, if the concentration of NTA in the cleaning product is below 0.1%.

*** The following substances are exempt:

- Enzymes (including stabilisers and preservatives in the enzyme raw material) can be included if they are in liquid form or granulate capsules.
- Microorganisms in professional products, see also requirement O9. The exception does not apply to foam/spray products.
- Fragrance can be included in the final product, see requirement O7 on fragrances. The exception does not apply to professional foam products.
- Sensitising preservatives, but see also requirement O6 Prohibited substances and O8 Preservatives.

✉ Safety data sheet for each raw material in line with European legislation (Annex II to REACH, Regulation (EC) No 1907/2006).

✉ Appendix 2 and 3 or equivalent certification completed and signed.

✉ Formulation (for foam/spray products)

Background to requirement O6

In the requirement, the generation 5 requirements R4 CMR substances and R5 Allergenic substances have been merged together and tightened with regard to sensitising substances.

For the same reason as described under requirement O2, there is a requirement that none of the constituent substances may be classified as carcinogenic, mutagenic, reprotoxic or sensitising.

By including requirements stating that substances categorised by specific inherent properties must not be used in ecolabelled products, the ecolabelling can meet concerns regarding safe use of specific chemicals and thus highlight environmental and/or consumer issues and concerns.

The exclusion of CMR substances and restrictions on environmentally harmful substances are part of Nordic Ecolabelling's strategic policy on environmental toxins. Excluding CMR substances has a high signal value but is not considered to have a great impact on the formulation of cleaning products in practice. In health terms, CMR substances are not desirable in cleaning products, since they are to a large extent handled by consumers in the home. This will also exclude potentially mutagenic and/or toxic for reproduction effects in the environment.

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

In this context, constituent substances are considered to be both the substances that make up the raw ingredients, and known degradation products such as formaldehyde, which is also prohibited under this requirement.

Lilial (CAS 80-54-6) has been self-classified as Repr2 H361 and is therefore excluded from use under this requirement.[39] Since fragrances are added intentionally and have a function, the minimal limit for fragrances does not apply and Lilial can therefore not be added to the product under this CMR requirement.

NTA (CAS 139-13-9) has been classified as Carc2 H351. NTA is thus prohibited on the grounds of its classification.

Complexing agents that replace NTA (GLDA and MGDA) contain small quantities of NTA 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, and that the concentration in the end-product must be below 0.1% by weight. The impurity limit in the raw material has been reduced from 1.0% in the previous generation, in order to take account of reduced impurity levels in today's raw materials.[40]

Nordic Ecolabelling wishes to minimise the amount of sensitising/allergenic substances in the products in order to reduce the risk of allergies.

When using cleaning products, in some cases the products will come into direct contact with the hands, for example when cleaning with a cloth that has to be dipped in a bucket of cleaning solution. In other cases, the user comes into contact with the spray mist that is formed during use (e.g., spray products in kitchens and bathrooms), and in this context it is desirable to reduce the sensitising substances with which the user comes into contact.

The substances that are often classified as sensitising are fragrance substances, preservatives and enzymes.

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. This cuts the risk of dust-forming enzymes in the manufacture of cleaning products. Enzymes are allowed even in foam/spray products in this generation of the criteria since the new requirement regarding foam nozzles has been added for all spray products. Enzymes were not allowed in previous generation of the criteria in spray products due to the higher risk of exposure with sprays compared to for example products diluted in a bucket. The environmental gains of enzymes are far greater than the health drawbacks and it is therefore desirable to open up for usage of enzymes in foam 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-

[39] https://echa.europa.eu/fi/brief-profile/-/briefprofile/100.001.173 (08.05.2017)
[40] http://susproc.jrc.ec.europa.eu/detergents/docs/DETERGENTS_Technical_Report_3.0%20.pdf

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, see O8. Allergenic fragrances are restricted more in foam for consumers than in concentrated products, since the exposure described above is different for sprays than for concentrated products.

Preservatives
See requirement O7 Prohibited substances and O9 Preservatives.

Foam/spray products
Products sold in spray bottles have a different exposure scenario to products that are diluted in water before use and applied with a cloth. Use of a spray forms a spray mist, which the user may breathe in. This increases the risk that the user will be exposed to allergens. The Nordic Ecolabel has in this criteria generation added a requirement stating that all spray products need to have a permanently mounted foam nozzle to produce a foam rather than a spray, see more under O29.

Several studies suggest a link between cleaning sprays and asthma in adults[41]. The amount of health-related aerosol fractions – inhalable, thoracic and respirable – in the spray mist can be significantly reduced by using a foaming nozzle, particularly with a foamer mesh[42] [43].

See requirement O7 regarding substances that cannot be used in Nordic Swan Ecolabelled products and requirement O9 preservatives where sensitizing preservatives are limited and MI banned. Sensitizing preservatives are allowed in generation 6 even in foam/spray products in the amounts stated in O5 and O9. Sensitizing preservatives were not allowed in spray products in the previous generation due to the higher exposure when using a spray product compared to for example a product. Since conventional sprays are not allowed in the criteria due to the requirement on foam nozzles the ban on this does not seem to be as relevant anymore.

See also requirement O18. The requirements in generation 6 have thus been brought into line with the requirements for spray products in generation 3 of the criteria for the Nordic Swan Ecolabelling of cleaning services, so that Nordic Swan Ecolabelled cleaning sprays for professional use can be used by Nordic Swan Ecolabelled cleaning services.

Microorganisms
There is a lack of clarity about whether microorganisms are classified as

[41] Siracusa A, De Blay F, Folletti I, Moscato G, Olivieri M, Quirce S, Raulf-Heimsoth M, Sastre J, Tarlo SM, Walusiak-Skorupa J, Zock J-P. Asthma and exposure to cleaning products – a European Academy of Allergy and Clinical Immunology task force consensus statement. Allergy 2013; 68: 1532–1545.
[42] 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
[43] Personal contact with Raymond Olsen, STAMI, 2017

sensitising, and Nordic Ecolabelling has thus chosen to exempt microorganisms from the requirement concerning sensitising substances in the same way that enzymes are exempt. Microorganisms are, similarly, not permitted in spray products, since sprays cause the formation of an aerosol on use, which increases the risk of inhalation problems.

Microorganisms and enzymes are also handled the same way during manufacture via a requirement concerning how microorganisms are added: microorganisms are only permitted if they are added in liquid form or as granules, in order to avoid dust-forming powders. It is unclear in which form microorganism manufacturers add their microorganisms and Nordic Ecolabelling therefore feels it is relevant to introduce a requirement that they must not be in a dust-forming format.

The requirement represents a tightening compared with generation 5 of the criteria.

O7 Prohibited substances

The following substances are excluded from use in the product:

- Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD)
- EDTA (Ethylene diamine tetraacetate and its salts) and DTPA (Diethylenetriamine pentaacetate)
- Quarternary ammonium salts that are not readily degradable
- Organic chlorine compounds and hypochlorites
- Methyldibromo glutaronitrile (MG, CAS 35691-65-7)
- Methylisothiazolinone (MI, CAS 2682-20-4)
- Nitro musks and polycyclic musk compounds
- phthalates
- Phosphate, phosphonate, phosphonic acid or phosphoric acid
- VOC

  Volatile organic compounds are defined in accordance with the European Commission's directive 1999/13/EC on the limitation of emissions of volatile organic compounds with steam pressure > 0.01 kPa at 20°C.

  Exemption for acetic acid, isopropanol, ethanol (including denaturing agents), and fragrances. Note that fragrances, acetic acid, isopropanol, and ethanol (including denaturing agents) must still fulfill all other requirements in this criteria document.
- Fluorine surfactants and other per- and polyfluorinated compounds (PFC)
- BHT (butylated hydroxytoluene, CAS 128-37-0)

  There is an exemption for BHT in fragrances in quantities of ≤100 ppm, on condition that the amount in the cleaning product does not exceed 1 ppm.
- D4 (octamethylcyclotetrasiloxane, CAS 556-67-2),

  D5 (decamethylcyclopentasiloxane, CAS 541-02-6),

  D6 (dodecamethylcyclohexasiloxane, CAS 540-97-6)
- Microplastics

  Microplastic means particles with a size of below 5 mm of insoluble macromolecular plastic, obtained through one of the following processes:

(a) a polymerisation process such as polyaddition or polycondensation or a similar process using monomers or other starting substances;

(b) chemical modification of natural or synthetic macromolecules;

(c) microbial fermentation.

Note that foils/films wrapping tablets and similar generating microplastics may not be Nordic Swan Ecolabelled.

- Substances that are considered to be potential endocrine disruptors in category 1 or 2, according to official lists within the EU. The EU's report on endocrine disruptors can be read in full at http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf (Appendix L, page 238 onwards)
- Substances evaluated by the EU to be PBT (persistent, bioaccumulative and toxic) or vPvB (very persistent and very bioaccumulative), in accordance with

- the criteria in Annex XIII of REACH and substances that have not yet been investigated, but which meet these criteria.
- Substances judged to be "Substances of very high concern", which are included on the Candidate List: https://echa.europa.eu/candidate-list-table.
- Nanomaterials/particles

  Nanomaterials/particles are defined in accordance with the European Commission's definition of nanomaterials dated 18 October 2011: "A natural, incidental or purposely manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for at least 50% of the particles in the number size distribution, one or more external dimensions are in the size range of 1-100 nm." Examples are ZnO, TiO2, SiO2, Ag and laponite with particles of nanosize in concentrations exceeding 50%. Polymer emulsions are not considered to be nanomaterial.

✉ A duly completed and signed declaration of compliance with the requirement, Appendix 2 or similar documentation for the product, Appendix 3 or similar signed documentation for the raw materials.

Background to requirement O7

There are several problematic substances that are difficult to exclude through general requirements concerning the product's chemistry. Nordic Ecolabelling has compiled a list of the substances that must not be added to products. The aim of the list is to prohibit substances that are not excluded from use via other requirements, but that are associated with environmental and health risks. Some substances are included in the list for the sake of clarity, even though they are prohibited under other requirements. There are also double requirements in the list below. For example, certain perfluorinated substances are also SVHC substances.

The requirements have been amended slightly compared with generation 5. A few new substances (such as microplastics and nanoparticles) have been added to the list.

APEO and APD

Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD) are a group of non-readily degradable surfactants that are proven endocrine disruptors. The substances have been phased out of most products through legislation. These substances are excluded from use under the surfactants requirement (R12). Declaring APEO and APD together with other substances under requirement O6 is not considered to add very much extra work for the applicant, but it does simplify the administration process.

The requirement is the same as in generation 5.

EDTA

EDTA (Ethylenediaminetetraacetic acid) and its salts are not readily degradable and the EU's risk assessment states that under the conditions at municipal water treatment plants EDTA is either not broken down or only breaks down to a slight degree (Cefic 2009). Today there are more environmentally aware alternatives that are degradable and that can replace EDTA. One example is MGDA (methylglycine diacetate). The EU is also working to restrict the use of EDTA in the paper industry (Official Journal of the European Union, 2006/C 90/04). EDTA is used as a complexing agent in many chemical products.

The exemption for phosphonates and EDTA in soap flakes from generation 5 has been removed since the producers of soap flakes have stopped using EDTA and phosphonates in their products and the exemption is deemed to be no longer relevant.

The requirement is the same as in generation 5, except that the exemption for soap flakes has been removed.

Quarternary ammonium salts that are not readily degradable

Quarternary ammonium compounds of cationic surfactants with adverse environmental effects, such as not being readily degradable, are excluded from use. There are sub-groups (such as esterquats) with good environmental properties, which are not excluded. Quarternary ammonium compounds are often highly toxic to aquatic organisms and, combined with the fact that they are not readily degradable, this results in the environmental hazard classification H411 or H412. Quarternary ammonium compounds are associated with bacterial resistance to antibiotics[44] and can promote certain types of allergy.

The requirement is the same as in generation 5.

Organic chlorine compounds and hypochlorites

Sodium hypochlorite or organic chlorine compounds such as triclosan are used as disinfecting/antibacterial substances. These may be or lead to the formation of toxic and bioaccumulative substances that are hard to break down. Sodium hypochlorite can constitute an environmental risk due to the risk of creating

[44] Buffet-Bataillon S., Tattevin, P., Bonnaure-Mallet, M, Jolivet-Goudeon, A. (2012). Emergence of resistance to antibacterial agents: the role of quaternary ammonium compounds – a critical review. International Journal of Antimicrobial Agents 39: 381–389. DOI: 10.1016/j.ijantimicag.2012.01.011

organic chlorine compounds. These have been prioritised for special attention specifically due to their use in consumer products (for example cleaning products), along with the risk of toxic chlorine vapour being formed when mixed with acid.[45]

The requirement represents a tightening compared with generation 5 of the criteria.

Methyldibromo glutaronitrile (MG)

MG (CAS 35691-65-7) is a highly allergenic substance. Studies show it to be so allergenic that it can cause allergic reactions even when present in products that are washed off immediately[46]. MG has no harmonised classification, but it is usually classified as H302, H315, H317, H318 and H400 and is therefore not entirely excluded by other requirements concerning classification of constituent substances.

The requirement is the same as in generation 5.

Methylisothiazolinone

Allergies to preservatives, particularly MI (CAS 2682-20-4) have risen in recent years[47] and Nordic Ecolabelling does not want to contribute towards unnecessary exposure. A large proportion of our licence holders and the Nordic retail chains wish to avoid MI (CAS 2682-20-4) as a preservative. Many of the Danish and Norwegian retail chains have banned MI in their Private Labels, and some also have bans/restrictions on MI in branded goods.[48]

Denmark's Environmental Protection Agency has done a study[49] in which they have looked at the content of preservatives in different detergents; cleaning and laundry products. The report showed that 59% of the conventional 158 cleaners checked had not declared any preservatives. The most commonly found preservatives found in this study were MI and BIT. They were each found in approximately 15 % of the products. Besides that, the study shows preservatives such as ethanol, benzylalcohol, phenoxyethanol and lactic acid

A proposal for a harmonised classification of Skin Sens 1A for MI has also been lodged with ECHA. The original proposal from the dossier submitter (Slovakia) was a limit of 0.06%, but ECHA's Committee for Risk Assessment has proposed a limit of 15 ppm. 1.5 ppm of MI will thus trigger the warning label "Contains xxx, may cause an allergic reaction". If the proposal is approved, in practice this will mean a total ban on MI, since such a low level cannot preserve products.

[45] 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
[46] Dobel, Shima, Miljøstyrelsen article published 15.04.2005: "Dansk pres giver resultat: EU-forbud på vej mod konserveringsmidlet MG i kosmetik"
[47] (Svedman, ym., 2012), (SCCS, 2013)
[48] Communication with the major Nordic retail chains in spring 2017
[49] MST, Kortlægning avf koserveringsmidler i vaske- og regøringsmidler, mars 2018

Due to the considerable sensitising potential, the strong focus on the substance, imminent legislation and a desire from end users to avoid MI, Nordic Ecolabelling has chosen to prohibit its use in Nordic Swan Ecolabelled products.

This is a new requirement that was not included in the preceding generation.

Nitro musks and polycyclic musks

Nitro musks and polycyclic musks generally have undesirable properties regarding both health and the environment. Some such compounds are already excluded from use via the requirement concerning CMR substances. Communication with fragrance manufacturers has confirmed that many European companies continue to use polycyclic musks in consumer products. The use of nitro musks is extremely limited, but manufacturers outside Europe still produce substances such as Musk ambrette that are prohibited under IFRA. Excluding nitro and polycyclic musks therefore remains relevant as a preventive measure.

The requirement is the same as in generation 5.

Phthalates

Phthalates have been prohibited in floor care products, and now that wash polish/wash-and-wax care products have been added to the criteria for cleaning products, the ban applies to both product groups. Phthalates may also be present in fragrances.

Interviews with manufacturers of ecolabelled floor care products (Nilfisk Advance AB and Ecolab AB, 2010) indicate that phthalates were phased out back in the 1990s and replaced with tributhoxyethylphosphate. Phthalates remain problematic in terms of health and the environment. It is thus still relevant to maintain a requirement concerning phthalates, where there is potential to replace them with other, less problematic, substances.

Phosphate, phosphonate, phosphonic acid and phosphoric acid

Phosphorous is one source of eutrophication. Phosphates used in farming are the primary cause of phosphates in the aquatic environment [EEA, 2005]. Phosphates in cleaning products are less significant, primarily since phosphates are effectively removed through sewage treatment. Generally, the emissions of phosphates from point sources such as wastewater have dropped over the past 30 years. This is mainly due to improved wastewater treatment in northern and Western Europe following the implementation of the Council Directive concerning urban waste water treatment (1991/271/EEC, EØS 2005).

Regulation (EC) No 648/2004 on detergents has recently been reviewed and the use of phosphates discussed. A proposal (COM (2010)) is to limit the use of phosphates and other phosphate compounds in household chemicals to 0.5% (phosphorous equivalent).

In Norway, a national regulatory requirement [FOR 2004-06-01] on phosphorous apply to chemical products such as cleaning products. The restrictions mean that products may contain no more than 0.2% by weight of phosphorous. This requirement is however independent of the dosage required for use. Accordingly,

highly concentrated products that require a low dose are penalised harder by the requirement.

Phosphorous is not particularly common in cleaning products but can be found in solid soap products. In those cases, phosphorous is found in Nordic Swan Ecolabelled products, the quantities are very small. The majority of cleaning products in places connected to a municipal wastewater system. In the associated product group of hand dishwashing detergents, there is no need for phosphorous.

In addition, in recent years concerns have risen over the size of phosphorous reserves and phosphorous may become a limited resource in the future.

The Nordic Ecolabelling wishes to prohibit phosphate, phosphonate, phosphoric acid and phosphonic acids from use in Nordic Swan Ecolabelled cleaning products. This is a change done after the public hearing, since comments were received stating that phosphorous may be present in other raw materials in low amounts, such raw materials would have been excluding with a total ban of phosphorous as stated in generation 5 (and on the public hearing).

Phosphonates (DID no. 119) are a group of phosphorous compounds that are good complexing agents, they are also prohibited by the requirement for phosphorous. Phosphonates are not harmful to aquatic organisms but are persistent and non-anaerobically biodegradable. Phosphonates contain phosphorous and can therefore cause eutrophication. Phosphonates are less commonly used than phosphate as a complexing agent since phosphate is a very strong complexing agent.

See the exemption above applying to phosphonates and EDTA in soap flakes.

The requirement has been changed from generation 5 where phosphorous was excluded. It has been changed to exclude phosphate, phosphonate, phosphonic acid and phosphoric acids.

VOC

VOCs have been restricted in floor care products, and now that wash polish/wash-and-wax care products have been added to the criteria for cleaning products, the restriction applies to both product groups.

Volatile organic compounds are undesirable, since they are typically harmful to health, often non-readily-degradable in an aquatic environment and can have negative effects on the earth's ozone layer. Volatile organic compounds are commonly used in floor care products, which is why there is a requirement restricting this type of substance.

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

A limit value of 0,5% for VOC in the products was stated in the public hearing. Several hearing comments were sent in and the Nordic Ecolabelling has revised the criteria to exempt acetic acid, isopropanol, and ethanol. Occupational hygiene limits have been compared for ethanol and isopropanol compared to other solvents. The limits between different VOCs is large. The short time limit for

ethanol (mg/m^3) 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. The Nordic Ecolabel has decided to exempt acetic acid, isopropanol, and ethanol from the requirement. In May 2019 it was decided to exempt fragrances from exclusion of VOC since it was never intention to ban the use of fragrances through this requirement. The exemption includes solvents in fragrances.

This is a new requirement.

Fluorine surfactants and other per- and polyfluorinated compounds (PFC)

Per- and polyfluorinated compounds (PFCs) constitute a group of substances that have harmful properties. Certain per- and polyfluorinated compounds can be broken down into the very stable PFOS (perfluorooctane sulphonate) and PFOA (perfluorooctanoic acid) and similar substances. These substances are found all over the globe, from the large oceans to the Arctic. PFOS have also been found in birds and fish and in their eggs. The substances are extremely persistent and are easily absorbed by the body.[50] The substances in this group impact on the biological processes of the body and are suspected to be endocrine disruptors, carcinogenic and to have a negative impact on the human immune system.[51] PFOA, APFO (ammonium pentadecene fluoro octanoate) and certain fluoride acids are on the Candidate List due to their reprotoxicity, as well as PBT. There are new research results showing that shorter chains (2–6 carbon atoms) have been discovered in nature.[52]

A Swedish report shows that the compounds are used in certain cleaning products.[53] They are particularly common in wash polish/wash-and-wax care products for floors. Consequently, Nordic Ecolabelling has chosen to place PFCs on the list of prohibited substances.

This is a new requirement that was not included in the preceding generation.

[50] Borg, D., Tissue Distribution Studies And Risk Assessment Of Perfluoroalkylated And Polyfluoroalkylated Substances (PFASS), Doctoral thesis, Institute Of Environmental Medicine (IMM) Karolinska Institutet, Stockholm, Sweden 2013 http://publications.ki.se/xmlui/bitstream/handle/10616/41507/Thesis_Daniel_Borg.pdf?sequence=1
[51] For example, Heilmann, C. et al, Persistente fluorbindelser reducerer immunfunktionen, Ugeskr Læger 177/7, 30.3.2015 OSPAR 2005: Hazardous Substances Series, Perfluorooctane Sulphonate (PFOS), OSPAR Commission, 2005 (2006 Update), MST, 2005b: Environmental project no. 1013, 2005, More Environmentally Friendly Alternatives to PFOS-compounds and PFOA, Danish Environmental Protection Agency, 2005.
[52] Perkola, Noora, Fate of artificial sweeteners and perfluoroalkyl acids in aquatic environment, Doctoral dissertation Department of Environmental Sciences, Faculty of Biological and Environmental Sciences, University of Helsinki, Finland 12.12.2014, https://helda.helsinki.fi/bitstream/handle/10138/136494/fateofar.pdf?sequence=1
[53] Swedish Chemicals Agency, 2015 http://www.kemi.se/global/rapporter/2015/report-7-15-occurrence-and-use-of-highly-fluorinated-substances-and-alternatives.pdf (visited 22.03.2016)

BHT

BHT (butylated hydroxytoluene, CAS 128-37-0) is classified by some[54] as muta., carc. and repr. 55 and it is thus excluded via its hazard classification, but for the sake of clarity it also remains on the list of prohibited substances. Fragrances do, however, contain small quantities of BHT as antioxidants that ensure the stability of the fragrance blend, which could otherwise affect the stability of the whole product.

This is a new requirement that was not included in the preceding generation.

Silicones and siloxanes (D4, D5 and D6)

Siloxanes and silicones (including polysiloxanes, which are also called silicones, but in purely chemical terms are not genuine silicones) are used to a considerable extent in wash polish/wash-and-wax care products for floors. These siloxanes contain D4 and D5 impurities, which are now restricted in line with the definition of constituent substances.

Low-molecular, volatile siloxanes (e.g., D4 and D5) evaporate when they are used and can disperse over large distances in the air. Cyclic siloxanes have the greatest degree of dispersal in the environment, particularly D4 (octamethyl cyclotetrasiloxane, CAS 556-67-2) and D5 (decamethyl cyclopentasiloxane, CAS no. 541-02-6). D4 is classified Aquatic Chronic 3 with H413 and Repr. 2 with H361f. D5 is structurally related to D4 and is on the Norwegian authorities' list of prioritised hazardous substances[56]. D5 is also under evaluation as a PBT substance but no conclusion has yet been reached. D4, D5 and the linear siloxane HMDS (hexadimethyl siloxane, CAS 107-46-0) are categorised as an HPVC chemical (high production volume chemical) in the EU. D6 is bioaccumulative with BCF = 39874 / logKow = 9.06 and is not biodegradable (4.47% in 28 days).[57] In a Swedish study D4, D5, D6 and HMDS were found in the breastmilk of 11 out of 39 women[58], while in trials carried out on rats D4 has a certain tendency to affect hormone production in female rats.[59] There is no ecotoxicological data but it is expected that D6 has some characteristics that correspond to D4 and D5. For example, it is expected that D6 will affect the liver on repeated exposure[60].

For D4 this is a double requirement because it was already prohibited under the requirement concerning classification of constituent substances (O5), but it is logical to mention it here together with D5. The other silicones and siloxanes must meet relevant environmental requirements in the criteria and if no data on degradability or toxicity is available, they are judged under a "worst case" like all other substances without sufficient data.

The requirement is new that was not included in the preceding generation.

[54] (ECHA, ei pvm), http://mst.dk/virksomhed-myndighed/kemikalier/stoflister-og-databaser/vejledende-liste-til-selvklassificering-af-farlige-stoffer/
[55] (ECHA, ei pvm)
[56] (Miljøstatus , 2014)
[57] (ECHA, 2015)
[58] (Miljøstyrelsen, 2014)
[59] (Miljøstyrelsen, 2014)
[60] (Environment Canada, Health Canada, 2008), (Miljøstyrelsen, 2014)

Microplastics

Microplastics are small plastic particles < 5 mm.[61] The definition has been updated after the hearing due to incoming comments. When microplastics are rinsed down the drain, they often end up in the sludge, but they also pass through the treatment works[62]. If the particles then continue on to lakes and seas, they are eaten by mussels, fish and other animals, causing injury. Some microplastics are then gradually broken down to even smaller particles by sunlight. They can also absorb harmful substances.

According to EU's report[63] 142 tons of microplastics are used in the industry according to information from AISE. Plastics used are for example polyester, polyurethane, PET glitters and PMMA. Microplastics are used as rheology modifiers, abrasives and for esthetical reasons. In addition to this the Swedish Chemical agency wrote in their comments that they in a future report on microplastics will show indication on microplastics appearing in cleaning products. For this reason and due to the precautionary principle, the Nordic Ecolabelling wants to be clear and prohibiting the use if microplastics in cleaning products.

The definition of microplastics has been updated after the public hearing to be the same as used by the EU Ecolabel[64] to harmonize between the documents. The definition is as follows:

> *Microplastic means particles with a size of below 5 mm of insoluble macromolecular plastic, obtained through one of the following processes:*
>
> *(a) a polymerisation process such as polyaddition or polycondensation or a similar process using monomers or other starting substances;*
>
> *(b) chemical modification of natural or synthetic macromolecules;*
>
> *(c) microbial fermentation.*

The Nordic Ecolabelling will continue to follow the work done in EU on microplastics and the microplastic definition and may come to update the definition in the criteria if an approved new definition is accepted in EU.

Note that foils/films wrapping tablets and such products releasing microplastics are not allowed in Nordic Swan Ecolabelled products.

This is a new requirement that was not included in the preceding generation.

Candidate List and SVHC, Substances of Very High Concern

SVHC, Substances of Very High Concern, is a term to describe the substances which fulfil the criteria in article 57 of the REACH Regulation, which states:

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[61] Miljøstyrelsen, Environmental project No. 1793 Microplastics Occurrence, effects and sources of releases to the environment in Denmark, 2015, http://www2.mst.dk/Udgiv/publications/2015/10/978-87-93352-80-3.pdf
[62] Miljøstyrelsen, Environmental Project No. 1906 Microplastic in Danish wastewater Sources, occurrences and fate, 2017, http://www2.mst.dk/Udgiv/publications/2017/03/978-87-93529-44-1.pdf
[63] European Commission (DG Environment), Intentionally added microplastics in products Final report, http://ec.europa.eu/environment/chemicals/reach/pdf/39168%20Intentionally%20added%20microplastics%20-%20Final%20report%2020171020.pdf, October 2017
[64] EU Ecolabel, http://ec.europa.eu/environment/ecolabel/products-groups-and-criteria.html

substances which are CMR (categories 1A and 1B in accordance with the CLP Regulation), PBT substances, vPvB substances (see the section below) and substances which are endocrine disruptors or environmentally hazardous without fulfilling the requirements for PBT or vPvB. SVHC can be included on the Candidate List with a view to subsequent inclusion on the Approval List. This means that the substance is subject to regulation (prohibition, phasing-out or another type of restriction). On the basis of these adverse characteristics, Nordic Ecolabelling prohibits substances on the Candidate List. Other SVHC substances are addressed via the prohibition of PBT and vPvB substances, and the requirement of classification and prohibition of endocrine disruptors.

The requirement concerning SVHC substances is the same as in generation 5 of the criteria.

Potential endocrine disruptors

Potential endocrine disruptors are substances which can affect the endocrine balance of people and animals. Hormones control a number of vital processes in the body and are particularly important to the development and growth of people, animals and plants. Changes in the hormone balance can have adverse effects, and there is special focus on hormones which affect sexual development and reproduction. Several studies have shown effects on animals that can be assumed to be due to changes in the hormone balance. Discharges to the aquatic environment are one of the biggest sources of the spreading of endocrine disruptors.[65] Nordic Ecolabelling prohibits the use of substances that are considered to be potential endocrine disruptors, category 1 (there is evidence of a change in endocrine activity in at least one animal species) or category 2 (there is evidence of biological activity related to changes in the hormone balance), in line with the EU's original report on "Endocrine disruptors"[66] or later studies.[67]

The European Commission is currently developing criteria for endocrine disruptors.[68] Nordic Ecolabelling is monitoring this development and may change the requirement when the EU criteria for the identification of endocrine disruptors are published.

The requirement concerning endocrine disruptors is the same as in generation 5 of the criteria.

[65] Miljøstatus i Norge (2008): Endocrine disrupters: http://www.miljostatus.no/Tema/Kjemikalier/Noen-farlige-kjemikalier/Hormonforstyrrende-stoffer/#D (dated February 26 2009)
[66] DG Environment (2002): Towards the establishment of a priority list of substances for further evaluation of their role in endocrine disruption. FINAL REPORT. European Commission DG ENV / BKH Consulting Engineers with TNO Nutrition and Food Research. 21 June 2000
[67] DG Environment. (2002): Endocrine disrupters: Study on gathering information on 435 substances with insufficient data. http://ec.europa.eu/environment/endocrine/documents/bkh_report.pdf#page=1, European Commission / DG ENV / WRc-NSF. (2002): Study on the scientific evaluation of 12 substances in the context of endocrine disrupter priority list of actions, http://ec.europa.eu/environment/chemicals/endocrine/pdf/wrc_report.pdf#page=29
DHI water and environment. (2007): Study on enhancing the Endocrine Disrupter priority list with a focus on low production volume chemicals. DG Environment. http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf
[68] Chemical watch, News, Andriukaitis promises EDC criteria "before the summer", 04.02.2016, https://chemicalwatch.com/44841/andriukaitis-promises-edc-criteria-before-the-summer

PBT and vPvB

PBT (persistent, bioaccumulative and toxic) and vPvB (very persistent and very bioaccumulative) are organic substances as defined in Annex XIII of REACH (Directive 1907/2006/EC)[69]. Nordic Ecolabelling does not generally wish to have these substances.

Most PBT/vPvB are excluded automatically from cleaning products due to the restrictions on environmentally hazardous substances (see O4). Since some of them, primarily vPvB, may possibly not be excluded in accordance with O4, they are prohibited by Nordic Ecolabelling.

Under the requirement, substances that have not yet been investigated but that meet the criteria for PBT and vPvB are also prohibited. The ban thus also applies to PBT and vPvB substances on the SIN list that are not yet on the SVHC list.

The requirement concerning PBT and vPvB substances is the same as in generation 5 of the criteria.

Nanoparticles

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.

There does not seem to be cleaning products on the Nordic Market with nanoparticles as of today. Internet searches show that there are single products with nanosilver as an anti-bacterial agent in other countries. It is therefore not impossible that nanosilver is going to be used on the Nordic Market. The Nordic Ecolabel therefore uses the precautionary principle to forbid nanosilver in the products.

On 18 October 2011, the European Commission made a recommendation for a definition of nanomaterials, stating that a nanomaterial is a “natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50% or more of the particles in the number size distribution, one or more external dimensions is in the size range 1–100 nm.” Nordic Ecolabelling adheres to the wording in this definition.

This is the same requirement as in generation 5 of the criteria.

Other substances discussed under this requirement

There was a discussion about whether the Chemsec's SIN list (Substitute It Now)[70] should be included in the list of prohibited substances. We have chosen not to do this, since we have no steerability over an external list, when it is

[69] REGULATION (EC) No. 1907/2006 of the EUROPEAN PARLIAMENT AND THE COUNCIL of 18 December 2006 concerning the registration, authorisation and restriction of chemicals (Reach) http://eur-lex.europa.eu/legal-content/sv/TXT/PDF/?uri=CELEX:02006R1907-20160203
[70] http://chemsec.org/ (2017-06-14)

updated and what substances it covers. According to discussions with Chemsec in 2017 and their SIN list website[71], the SIN list is updated automatically to include all the SVHC substances, plus there are occasionally separate projects to consider substances for inclusion on the SIN list. We can, however, use inclusion on the list as justification for a ban on specific relevant substances. According to a review of the SIN list and the requirements in these criteria, there are 15 substances on the SIN list that we do not prohibit, most of which are PBT/vPvB substances and endocrine disruptors. We have come to the conclusion that these substances are not relevant for cleaning products, since they relate to organotin compounds and bisphenols, for example. In writing in the background document about substances that are on the SIN list for being PBT or vPvB (see above) we do, however, cover the four PBT/vPvB substances on the SIN list that are not yet on the SVHC list.

Halogenated/aromatic solvents are judged not to be relevant for the product group and are not included on the list of prohibited substances. However, they are restricted via other requirements due to their undesirable properties. For example, many halogenated solvents can be found on the SVHC list.

O8 Fragrances

The requirement also includes fragrances in plant extracts.

a) Fragrances must be added in line with IFRA's guidelines.

The guidelines of IFRA (International Fragrance Association) can be found at www.ifraorg.org/

b) Fragrances must not be present in professional* foam cleaning products or their refills.

c) A fragrance substance which is judged to be sensitising with the hazard statement H317 and/or H334, or which is subject to declaration, may be present at a maximum of 0.0100% (100 ppm) in the cleaning product.

In concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water any of the above mentioned substances may be present in concentrations up to 0.0100% by weight (100 ppm) in the) in the diluted final product. Note, however, that requirement O5 and prohibition of H317 / H334 apply to these refills in concentrated form.

d) The fragrance substances in Table O7 may be present in products at a maximum of 0.0100% (100 ppm) per substance:

Table O8 Other fragrance substances that may be present to a maximum of 100 ppm

INCI name (eller om en inte finns, parfymering namn i enlighet med CosIng)	CAS nummer
Cananga Odorata och Ylang-ylang oil	83863-30-3; 8006-81-3
Eugenia Caryophyllus Leaf / Flower oil	8000-34-8
Jasminum Grandiflorum / Officinale	84776-64-7; 90045-94-6; 8022-96-6
Myroxylon Pereirae	8007-00-9;
Santalum Album	84787-70-2; 8006-87-9

[71] http://chemsec.org/business-tool/sin-list/sin-list-updates/ (14.06.2017)

Turpentine oil	8006-64-2; 9005-90-7; 8052-14-0
Verbena absolute	8024-12-02
Cinnamomum cassia leaf oil/Cinnamomum zeylanicum, ext.	8007-80-5/84649-98-9

In concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water any of the above mentioned substances may be present in concentrations up to 0.0100% by weight (100 ppm) in the) in the diluted final product. Note, however, that requirement O5 and prohibition of H317 / H334 apply to these refills in concentrated form.

e) HICC, chloroatranol and atranol are not permitted in the product.

f) Foam products for consumers: Fragrances subject to declaration under Regulation (EC) No 648/2004 on Detergents as amended and/or classified as H317 and/or H334 and/or listed in Table O8 above must not exceed levels of > 50 ppm (> 0.0050%) per substance in the cleaning product.

Refills for foam/spray products can contain each of the above-mentioned substance in concentrations of up to 0.050% by weight (500 ppm), on condition that the stated dilution gives a concentration in the diluted product of less than 0.0050% by weight (50 ppm).

***** *Products for professional use are defined here as products that are marketed for use in professional contexts such as institutions, catering kitchens, restaurants and within the public sector.*

Where products are sold to both professionals and consumers, the product is considered a professional product if the proportion sold to professionals is 80% or higher. Where 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. The requirement also includes fragrances in plant extracts.

✉ Appendix 2 and 3 or equivalent certification completed and signed plus fragrance specifications.

✉ Calculation of the amount of the 26 allergens, substances classified as H334 and/or H317 and substances listed in table O8 present in the end product.

Background to requirement O8

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 a number of 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. Most fragrances contain substances that are classified as H334 and/or H317 and many are classified as H411, H412 or H413.

According to the Videnscenter for Allergi (the Danish centre for research into allergies) there is in principle no limit for when an allergy causes problems[72] . It is felt, however, that a total ban on sensitising fragrances would make Nordic Swan Ecolabelled cleaning products much less widespread on the market, and this would

[72] Personal contact with Jeanne Duus, Videncenter for Allergi, 2009

reduce the overall health and environmental gains from ecolabelled products in this category, as many consumers demand perfumed products. Since both retailers and manufacturers state that fragrances are relevant for a large number of customers, fragrances are permitted in cleaning products for the consumer market. Consumers can choose between fragranced and fragrance-free products because the existence of fragrance must always be declared on the packaging.

Many Nordic Swan Ecolabelled cleaning services prefer fragrance-free cleaning products and are trying to steer the industry in that direction. However, a significant proportion of customers still want a fresh smell after cleaning. Several manufacturers of cleaning products also report that fragranced cleaning products hold a substantial market share. Nordic Ecolabelling therefore believes that a total ban on fragrances would also make Nordic Swan Ecolabelled cleaning products considerably less widespread in the professional market. Professional cleaners are not always able to choose whether they want to use fragranced or fragrance-free products. By permitting fragrances and at the same time setting specific fragrance requirements that go further than current legislation and IFRA's standards, Nordic Ecolabelling wishes to enable professional users, if necessary, to choose perfumed products that are among the best on the market in terms of health and environment.

With cleaning products, it is environmentally important to ensure correct dosing, effective products, optimum use of packaging and that other chemical substances used in large quantities (such as surfactants) have as little impact on the aquatic environment as possible. By tightening the requirements for these, Nordic Ecolabelling secures environmental gains for the product group. With fragranced Nordic Swan Ecolabelled products, we can encourage the large fragrance-buying portion of the customer segment to choose a product that has less of an impact on the environment. In addition, Nordic Ecolabelling handles fragrance substances in the same way as other chemical substances, via environmental requirements. Requirements concerning environmentally hazardous substances, non-degradable substances and CDV are considered to limit the amount of fragrances in products and encourage fragrances with a better environmental profile.

Requirement a) The requirement for compliance with the guidelines of IFRA (International Fragrance Association)[73] 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. The requirement is the same as in generation 5 of the criteria.

Requirement b) excludes fragrances from professional spray cleaning products since the cleaner is exposed frequently, and often involuntarily, to these, see also text above. Nordic Ecolabelling feels there is a strong justification for this requirement, since cleaning products are used in large quantities, in some cases in direct contact with the skin and in other cases in the form of sprays that create

[73] http://www.ifraorg.org/GuideLines.asp.

an aerosol during use. The requirement is the same as in generation 5 of the criteria.

Requirement c) The restriction on sensitising fragrance substances is included in order to reduce the risk of allergies when using ecolabelled cleaning products. The aim of the requirement concerning allergenic fragrances in Nordic Swan Ecolabelled products is to provide as much protection against new allergies as possible. Nordic Ecolabelling has decided that it is appropriate to go further than the legislation in terms of limiting sensitising substances. The requirement is the same as in generation 5 of the criteria.

Requirements d and e) relate to substances that have more recently been judged to be sensitising: In June 2012 a new opinion was issued by the EU's Scientific Committee, SCCS, stating that 127 substances should be declared on products instead of the current 26, "Scientific Committee on Consumer Safety SCCS OPINION on Fragrance allergens in cosmetic products (SCCS/1459/11)[74]". In this report, SCCS recommends that all the fragrance substances for which they have evidence of being potential allergens must be declared by name on cosmetic products. Among the 127 fragrance substances, 26 are already restricted under the Detergent Regulation, and in total 20 have the hazard classification H317. SCCS refrains from recommending decided maximum limits for the content of all the fragrance substances in cosmetic products, particularly due to a lack of underlying data. However, SCCS states that the general limit of 100 ppm is tolerated by the majority of consumers and wishes to guard against the development of new allergy sufferers among both generally tolerant and sensitive people.

Nordic Ecolabelling has conducted a dialogue with IFRA and fragrance producers and checked the status of IDEA (International Dialogue for the Evaluation of Allergens)[75] concerning the 127 allergenic fragrances. SCCS and IDEA are working to develop methods for quantifying more of these 127 substances. This work has not been completed and the earliest date by which there is expected to be a declaration requirement in European legislation is 2019. In light of this, Nordic Ecolabelling has chosen to tighten up the requirement on fragrances by adding a requirement to restrict the 7 substances (see Table 2), with the greatest risk of sensitisation in the SCCS report (SCCS/1459/11)[76]. Most of these 7 substances do not have a harmonised classification under ECHA's summary of classification[77], but some are classified as H317. A gradual ban on more fragrance substances will be introduced in accordance with the SCCS recommendations, but the change will keep pace with testing methods and the scope to document that fragrances are not found in the fragrance blend.

SCCS also recommends that three substances Chloroatranol, Atranol and Hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC) are not included in cosmetic products. We therefore consider it relevant to also prohibit their presence in cleaning

[74] SCCS (Scientific Committee on Consumer Safety), opinion on fragrance allergens in cosmetic products, 13–14 December 2011
http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_073.pdf
[75] http://www.ideaproject.info/ (03.06.2015)
[76] SCCS (Scientific Committee on Consumer Safety), opinion on fragrance allergens in cosmetic products, 13–14 December 2011
http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_073.pdf
[77] ECHA, Summary of Classification and Labelling, https://echa.europa.eu/sv/information-on-chemicals/cl-inventory-database (08.05.2017)

products. Chloratranol and Atranol occur in Oak moss (Evernia Prunastri) and Tree moss (Evernia Furfuracea) extract. Nordic Ecolabelling also wishes to exclude these from Nordic Swan Ecolabelled cleaning products.

The Danish Environmental Protection Agency has investigated 42 sensitising fragrance substances, in order to assess whether these substances are potent enough to meet the criteria for classification as strong/extreme skin sensitisers in category 1A, as set out in the CLP regulation.[78] The report concludes that 11 fragrances should be classified in the subcategory 1A (strong/extreme skin sensitisers). These substances are as follows:

Citral CAS no. 5392-40-5, Cinnamaldehyde CAS no. 104-55-2, Cinnamyl alcohol CAS no. 104-54-1, Coumarin CAS no. 91-64-5, Eugenol CAS no. 97-53-0, Farnesol CAS no. 4602-84-0, Geraniol CAS no. 106-24-1, 7-Hydroxycitronellal CAS no. 107-75-5, Methyl oct-2-ynoate CAS no. 111-12-6, Evernia prunastri, ext. (Oakmoss extract) CAS no. 90028-68-5 and Cinnamomum cassia leaf oil/Cinnamomum zeylanicum, ext. CAS no. 8007-80-5/CAS no. 84649-98-9. The first 10 substances are among the 26 fragrances that are subject to declaration and these are already governed by Nordic Ecolabelling's requirements. Cinnamomum cassia leaf oil/Cinnamomum zeylanicum, ext. CAS no. 8007-80-5/CAS no. 84649-98-9 is new and has been added to the list in Table O7.

Note that nitro musks are prohibited in fragrances under requirement O5 and that Lilial (CAS 80-54-6) is self-classified as Repr2 H361 and is therefore excluded from use via O5.

The requirements e and f are new.

Requirement f) Nordic Ecolabelling sets particularly strict requirements for products sold in spray/foam spray bottles, since they are used in a different way to products that are diluted before use. When using a spray product, there is a greater risk of breathing in allergenic substances since a spray mist is formed, something that does not happen when a concentrated product is poured into a bucket of water. Although respiratory aerosols are reduced using foam nozzles, Nordic Ecolabelling has chosen to use precautionary principle and maintain the requirement. The limit is set at 50 ppm, which is based on licence data that Nordic Ecolabelling has gathered with regard to spray products for consumer use. The levels of allergens in sprays come primarily from the fragrances, and of those that are classified as allergenic (H334 and/or H317), the levels generally range from 5 ppm up to almost 100 ppm, but with most coming in at around 50 ppm. This requirement therefore feels reasonable as a way to minimise the number of allergens to which the user is exposed. See also requirement O18 regarding spray nozzles. The requirement is the same as in generation 5 of the criteria, but it has been specified that foam spray bottles are included.

[78] Miljøstyrelsen 2016, Environmental project No. 1840, Evaluation of selected sensitizing fragrance substances A LOUS follow-up project http://www2.mst.dk/Udgiv/publications/2016/03/978-87-93435-46-9.pdf

O9 Preservatives

a) Preservatives included in the product or constituent substances must not be bioaccumulative. Preservatives are judged not to be bioaccumulative if BCF < 500 or logKow < 4. If both values are available, the value for the highest measured BCF is to be used, see appendix 1.

b) Sensitising preservatives are permitted to a maximum of 100 ppm. Note that requirement O5 and O6 must also be fulfilled. Methylisothiazolinone (MI, CAS 2682-20-4) is forbidden in the products in requirement O7

✉ a) Documentation of BCF or logKow, Appendix 2 and 3 or similar documentation completed and signed and safety data sheet for the preservative.

✉ b) Calculation of the amount of ingoing sensitising preservatives in the final product.

Background to requirement O9

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.

In 2008, Nordic Ecolabelling conducted a survey of preservatives in cleaning products. That information was updated as part of this revision. The results show that our requirements concerning preservatives are strict. Preservatives used in cleaning products must according to Biocidal Products Regulation ((EU) 528/2012) be approved to PT6 (product type 6: Preservatives for products during storage) in line with the Biocidal Products Regulation. Today there are 51 PT6 preservatives that can be used in cleaning products (10 approved and 41 under review). Of these, around a half are sensitising (of which 6 are isothiazolinones plus DTBMA, which forms isothiazolinone). 12 are formaldehyde donors. The different preservatives are not necessarily interchangeable. They have different levels of effect on different types of microorganisms (gram positive and gram-negative bacteria and fungi). Some organic acids, such as lactic acid and sorbic acid, also have relatively little effect when the pH sits around the neutral area, while peroxides and DBNPA are not used very widely as they break down relatively quickly. Isothiazolinones and formaldehyde donors are the two main families of biocidal active substances for cleaning products.[79]

There are several other requirements, in addition to the requirement on preservatives, that also restrict the range of preservatives. Via the CMR ban (see O5), for example, we prohibit formaldehyde and formaldehyde-releasing products, the latter of which have been widespread. The ban on organochlorides (see O6) excludes CMIT (chloromethylisothiazolinone, CAS 26172-55-4), which is

[79] https://circabc.europa.eu/sd/a/8035cf70-bf96-4c4d-90c2-0faae8652287/CA-Nov14-Doc.4.6%20-%20PT6%20impact%20assessment.pdf

also a common preservative. The ban on endocrine disruptors (see O6) rules out 2-Phenylphenol, for example.

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.

Unless otherwise proven, substances are considered to be bioaccumulative if logKow ≥ 4.0 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) ≥ 500 the substance is considered to be bioaccumulative, and if the BCF < 500 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.

The requirement is the same as in generation 5 of the criteria.

b) Since allergies to preservatives have risen in recent years[80] and Nordic Ecolabelling does not want to contribute towards unnecessary exposure, Nordic Ecolabelling has also chosen to restrict the other sensitising preservatives, alongside the ban on MI, see O7.

The EU Ecolabel has introduced restrictions on isothiazolinones in its new criteria for cleaning products. The limits have been chosen because these are the most typical concentrations in the products that JRC has examined.[81]

Nordic Ecolabelling has chosen to allow sensitising preservatives in quantities that do not trigger the labelling of the cleaning product with the warning "Contains xxx, may cause an allergic reaction", other than MI. A limit of 100 ppm has also been set – a value that previously applied to all preservatives classified as Skin Sens 1, that is all those that lack sub-group A or B – in order to avoid large quantities of Butylbenzisothiazolinone (BBIT, cas 4299-07-4), for example, which would be much higher than the other isothiazolinones.

By permitting other isothiazolinones, MI-free formulations containing limited levels of other isothiazolinones in combination with other active substances may become attractive alternatives in a number of cleaning products. This is a new requirement that was not included in the preceding generation.

A requirement for optimised quantities of preservatives was previously included in this requirement in order to avoid the unnecessary addition of preservatives. This was documented via a Challenge test (provocation test, load test), which is performed in conjunction with the development of the product or equivalent. The requirement on Challenge tests was included in generation 5 of the criteria but the Nordic Ecolabelling has decided to remove that after the public hearing in generation 6.

[80] (Svedman, ym., 2012), (SCCS, 2013)
[81] http://susproc.jrc.ec.europa.eu/detergents/docs/DETERGENTS_Technical_Report_3.0%20.pdf

The Nordic Ecolabelling considers the risk of additions of increased amounts of preservatives to be small, since there are other requirements in this document limiting the amounts of preservatives in cleaning products (for example CDV, long term environmental effects and sensitizing substances) in combination with the additional cost for producers when adding more preservatives than necessary. The extra environmental gain by a requirement on Challenge tests is therefore considered to be small. The producers do often perform Challenge tests during product development to optimize the additions of preservatives, but the test is not always done exactly the way as Nordic Ecolabelling previously had stated in the requirement. The requirement has been changed compared to generation 5 of the criteria.

O10 Microorganisms

a) Products containing microorganisms to be eligible for Nordic Swan Ecolabelling are professional cleaning products for indoor use (within the product group definition). See also R5 which excludes microorganisms in spray products.

b) Only microorganisms that fulfil the following requirements may be included in the cleaning product:

- The microorganisms are found in Risk group 1 in Directive 2000/54/CE.
- It must be controlled, that the product is not contaminated with pathogen microorganisms
- The microorganisms must not contain any of the following pathogen species when screened using the following or equivalent test methods:
  - E. Coli, test method ISO 16649-3:2015
  - Streptococcus (Enterococcus), test method ISO 21528-1:2004
  - Staphylococcus aureus, test method ISO 6888-1
  - Bacillus cereus, test method ISO 7932:2005 or ISO 21871:2006
  - Salmonella, test method ISO6579:2002 or ISO 19250
- The microorganisms' DNA is identified according to a "Strain identification protocol" (using the 16S ribosomal DNA sequencing or other equivalent methods).
- Are not resistant to the following types of antibiotics:
  - Aminoglycosides
  - Macrolides
  - Beta lactam
  - Tetracyclines
  - Fluoroquinolones or other quinolones

  according to EUCAST or Nordic AST or other equivalent method.
- Microorganisms must not be GMO.
- Colony forming units (CFU) > 1,0 x 105 microorganisms per ml in-use solution.
- The products must on their labels/product information sheet or in other marketing material provide the user with the following information:
  - That the product contains microorganisms

  - Instruction saying that the products shall not be used on surfaces in contact with food.
  - That the products shall not be used with spray application
- Products containing microorganisms shall display superior cleaning performance beyond the general cleaning requirements of R15 and R16. It must be demonstrated that the cleaning product can degrade the following:
  - 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.
- Shelf-life: show that the microorganisms have a good stability by performing a stability test at room temperature showing that the microorganisms not decrease more than 20% alternatively decrease at < 1log per year according to ISO 4833-1:2014 (Horizontal method for the enumeration of microorganisms) or through other scientifically acknowledged method to count the number of microorganisms.

Analysis shall be performed by a laboratory fulfilling the requirements of Appendix 2.

Note that products containing microorganisms sold in Norway have to fulfil the national legislation "FOR 1998-01-22 nr 93" and that they must also be listed on www.pib.no. In addition to that "FOR 2004-06-01 nr 931" must be fulfilled when relevant.

✉ Documentation demonstrating that the microorganisms are classified as Risk Group 1.

✉ Documentation describing how it is controlled that the products is not contaminated with pathogen microorganisms

✉ Test results demonstrating the the microorganisms does not contain the following pathogen species: E. Coli, Streptococcus (Enterococcus), Staphylococcus aureus, Bacillus cereus, and Salmonella.

✉ Documented DNA identification.

✉ Test results demonstrating that the microorganisms are not resistant to antibiotics, do not include the aforementioned pathogenic strains and are not GMO.

✉ Documentation of colony forming units per ml in-use solution.

✉ Performance test demonstrating that the product can degrade protein, start, fat and oil.

✉ Product label and marketing material showing that that product is designed for professional use, application method and that the above-mentioned requirement regarding information on the label is present.

✉ Stability study showing shelf life according to the requirement above.

Background to requirement O10

The microorganisms used in cleaning products are living microorganisms. They are primarily used in product for professional use for cleaning floors, sanitary areas and drains. Microorganisms are used in cleaning products since they extend the duration of the cleaning effect of the product and enable the product to continue to perform even post cleaning. Nordic Ecolabelling criteria for cleaning products do not cover drain cleaners at all, and also do not cover products containing microorganisms for outdoor use. The reason is that, the consequences and impact of the microorganisms on the external and aquatic environment, when being discharged directly into nature is unknown.

Briefly, microorganisms are found in nature in the form of spores. These spores develop into active microorganisms in contact with organic material which they eat/decompose. This decomposition continues until there is no organic material remains. Some of the microorganisms then die and some return to spores. When new organic material is available, the microorganisms once again become active. The function of microorganisms 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 (personal correspondence with Innu Science and Novozymes). Decomposition continues until there is no more organic material to decompose. Some microorganisms return to spores and are reactivated when new organic material becomes available while some die. It is therefore necessary to add new microorganisms periodically to continue this decomposition (personal correspondence with Innu Science and Novozymes).

Cleaning products with microorganisms also contain other ingredients such as surfactants. Surfactants are necessary since there is a delay before the microorganisms take effect. Surfactants provide an immediate cleaning effect alongside mechanical cleaning. After that, the microorganisms take effect and decomposition products form on the surface and can be wiped off.

The primary advantage of products containing microorganisms is that the surface remains clean longer. They are also effective on surfaces that can otherwise be difficult to keep clean such as grouting between tiles. 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 (personal communication with Innu Science and Novozymes).

Another advantage of these products is that the decomposition of organic material also removes bad odours. The need to mask such odours with fragrances is considerably reduced. Cleaning products containing bacteria can reduce bad odours since they reduce the growth of other microorganisms by decomposing the organic material on which these odour-forming microorganisms feed.

The most commonly used organism is Bascillus Sp (personal correspondence with Innu Science), which are microorganisms found naturally throughout the world. These microorganisms are well known and well documented in various contexts. In contact with producers of microorganisms, Nordic Ecolabelling has learnt that the same or similar microorganisms as used in cleaning products are used in sewage works. The risks of these microorganisms are therefore low with regard

to emissions to water. The quantities of microorganisms in the products are also low.

Professional products

Nordic Ecolabelling has chosen in this version of the criteria to limit the use of microorganisms to products for the professional market. Professional users have more experience of cleaning products and different equipment from consumers.

As described under the product group definition microorganism products for spray applications are not included in the product group. The reason for that is to lower the risks of inhalation of substances that can be sensitising, see also R5.

Risk Group 1

The microorganisms that Nordic Ecolabelling permits must be DNA identified and belong to Risk Group 1[82] according to Council Directive 2000/54/EC, i.e. non-harmful to human health. Risk Group 1 only includes microorganisms/bacteria that have been evaluated to ensure that they are not resistant to antibiotics and similar. Nordic Ecolabelling only permits microorganisms in Risk Group 1.

The Canadian ecolabel EcoLogoTM[83] has had criteria[84] since 2002 for products containing microorganisms. EcoLogo stipulates requirements on the number of colony forming units[85] (see the Nordic Ecolabelling requirements on CFU below), requires that bacteria are in Risk Group 1[86] and are DNA identified, and that the product does not contain E. Coli, Streptococci, Staphylococci, bacillus cereus or salmonella (see the Nordic Ecolabelling requirements below).

Pathogen species

The inclusion of pathogen bacteria is not desired. This is already strictly regulated by only permitting microorganisms belonging to Risk Group 1. However, Nordic Ecolabelling considers it important to avoid contaminations and to exclude pathogen species such as E. coli, streptococcus (Enerococcus), staphylococcus aureus, bacillus cereus and salmonella. A similar requirement is seen by EcoLogo (EcoLogo, CCD 110).

The test methods are taken from the manufacturers of biological products and ingredients (personal communication with Innu Science and Novozymes).

DNA identification

In order to set requirements of the constituent microorganisms, these must be DNA identified. Knowing what microorganisms are in the product is essential.

[82] Group 1: A biological agent that is most unlikely to cause human disease.
[83] www.ecologo.org
[84] CCD 110, Cleaning and degraseing compounds: biologically based, http://www.ecologo.org/en/seeourcriteria/details.asp?ccd_id=455
[85] http://www.moldbacteriaconsulting.com/colony-forming-units-cfu.html
[86] Council Directive 2000/54/EC, Group 1: A biological agent that is most unlikely to cause human disease.

A strain identification protocol shall be used for this purpose.

Identification can be performed using for example 16S ribosomal DAN, which is described in the following references:

Test	Reference
16S ribosomal DNA sequencing	Applied and Environmental Microbiology, 67: 4520-4530 (2001) Applied and Environmental Microbiology, 71, 1178-1183 (2005)

Antibiotic resistance

Nordic Ecolabelling has included particular requirements on antibiotic resistance since resistant bacteria are a problem at large in society.

There are many antibiotics on the market. The major types are aminoglycosides, macrolides, beta- lactam, tetracyclines and fluoroquinolones.

Läkemedelsverket[87] (Medical products agency) in Sweden was contacted regarding this requirement and they found it necessary to add that tests for Europe should be performed and interpreted according to EUCAST (European Committee on Antimicrobial Susceptibility Testing)[88] or Nordic AST[89] (Nordic Committee on Antimicrobial Susceptibility Testing).

GMO

The decision to prohibit GMO-based ingredients is founded on a precautionary principle. Since GMO-based ingredients can be used during microorganism production, there is a ban on these.

GMOs are a contentious issue and the cultivation of GMOs is prohibited in several countries. Issues include food safety, the use of agricultural land, a lack of knowledge regarding the effects of GMO crops on local agriculture and forests, and the risk of negative environmental and health effects. The WHO defines the risk of GMOs as follows: the risk that genetically modified organisms spread their genes to wild populations; the continued presence of GMO following harvest; the sensitivity of non-targeted organisms to GMO; threats to genetic stability; a decline in biodiversity; and an increase in the use of chemicals in agriculture

Colony forming units

Colony forming units (CFU) refers to the individual colonies of bacteria, mould or yeast. CFU is a measure of how many colonies are found on a surface. This is evaluated by preparing a specimen that is spread evenly over an agar plate. This is then incubated at a suitable temperature and for a suitable period. The colonies that form are counted for a surface area or volume giving a measure of the number of colonies per kg, ml or similar (MBL, 2012).

[87] Mail correspondence with Charlotta Edlund, Professor in microbiology, clinical researcher at Läkemedelsverket (2013-10-11)

[88] http://www.eucast.org/

[89] http://www.nordicast.org/page/35

The threshold for the number of CFU is based on data collected from the industry (personal communication with various manufacturers) and collaboration with Ecologo. A limit value that there must be more than 1.0 x 105 CFU in the in-use solution ensures that the microorganisms are included to produce a noticeable effect and not merely for marketing. The limit value refers to the in-use solution and not the concentrated product since it is most relevant to consider the number of microorganisms in the solution that is used during cleaning.

Information on data sheet/label

So that is clear to the end user that a product contains microorganisms, this must be clearly state on the product's label and/or data sheet. This is so that the user can decide on where and how to use the product.

It must be clear that the products are not to be used in places where immunocompromised people are present or on surfaces in contact with food.

It is important not to use microorganism-based products in areas where there are risks of contaminating food or in hospitals where immunocompromised people are present. Such requirements are also set in the criteria document from Green Seal[90]. To exclude the products in places where children are present is not as motivated. In schools, public swimming pools and other public places there is a need of products that also can remove bad smell better than just masking them with perfumes, which makes it less relevant to say that these products cannot be used amongst children. Ecologo does not have a restriction in concern to children either.

It should also be made clear on the labels that the products are not meant for spray application, i.e. the products should be recommended for other types of usage than spray application. As mentioned earlier in this document, the main reason is to lower the risks of inhaling aerosols caused by spraying.

Performance

One of the advantages of products containing microorganisms is that offer a prolonged cleaning effect. To ensure that Nordic Swan Ecolabelled products offer good cleaning performance, products containing microorganisms must comply with requirement R15 or R16 (as all other cleaning products) and demonstrate that the product breaks down starch, fat, oil and protein. This can be demonstrated through tests such as:

- 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.

[90] www.greenseal.org

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

See also the added question regarding microorganisms in appendix 5a-c.

Shelf life

By performing a stability test the producer will show that the reduction of microorganisms over time is low, to ensure that the products perform well after storage when reaching the final users. After dialogue with Innu Science and Novozyme the requirement regarding shelf life, below has been included.

National legislation in Norway concerning microorganisms

There is in Norway legislation concerning declaration of microorganism containing products, FOR 1998-01-22 nr 93. Equivalent legislation does not exist in the other Nordic countries.

Products to be sold or marketed in Norway containing microorganisms have to fulfil the Norwegian legislation concerning microorganism just as all products need to fulfil all relevant legislation.

The Norwegian declaration of products of microorganism-based products is described in FOR 1998-01-22 nr 93, which is a declaration to be filled out and sent in. The Norwegian Environment Agency is the authority supervising this legislation. The active supervision is limited. The products that have been declared and approved can be found in the product registry (www.pib.no). The declaration does not contain information about performance or how product claims can be supported.

In the requirement below there is a text saying that products for the Norwegian market need to show that they fulfil the declaration legislation by being on www.pib.no as declared products.

There has also been discussions regarding “Forskrift om begrensning av forurensning (forurensningsforskriften) – FOR 2004-06-01”, but since it does not specifically treat microorganism products it is only included as a note to be fulfilled when relevant (it covers pollutants from many different industries).

The requirement is the same as in generation 5 of the criteria.

6.4.2 Ecotoxicity and biodegradability

The highest recommended normal dose should be used in all the calculations. Often a higher dose is stated for specific tasks that are not carried out on a daily basis. Calculations are not required for the specific tasks. The water in the WC is never included as part of the in-use solution.

For concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water requirements O11-O13 apply for the diluted final product.

Note that if the refill is dosed as a unit containing a water-soluble foil intended not to be removed before diluting, the foil must be part of the product formulation

in the requirements dealing with CDV, environmental hazards and aNBO and anNBO. (O11-O13).

O11 Long-term environmental effects

The use of constituent substances which are classified with any of the hazard statements H410, H411 or H412 incl. self-classification in the ECHA database is limited as follows:

FV < LV

$FV = 100*CH_{410} + 10*CH_{411} + CH_{412} \leq$ LV grams/litre in-use solution

where

FV = Factor value

LV = Limit value, see table O11

CH_{410} = concentration of substances with H410 in grams/litre in-use solution

CH_{411} = concentration of substances with H411 in grams/litre in-use solution

CH_{412} = concentration of substances with H412 in grams/litre in-use solution

The product's FV is calculated on the basis of the highest recommended normal dose stated on the packaging.

Table O11 Limit values for environmentally hazardous substances

Category	Limit value (LV) (g/l in-use solution)
Concentrated, consumer	0.020
RTU, WC, consumer	0.50
RTU, other, consumer	0.30
Concentrated, professional	0.0020
Spray, professional	0.10
RTU, other (incl. WC), professional	0.050
RTU windows, professional, consumer	0.30
Facade and terrace cleaners	0,020

Exemptions:

- Protease/Subtilisin classified as Aquatic Chronic 2 (H411) is exempt from the requirement, see also the requirement concerning enzymes in O6
- Surfactants classified as H411 and H412 are exempted from the requirement, on condition that they are readily biodegradable* and anaerobically biodegradable**.

** In accordance with the DID list, version 2016 or later. If the substance is not on the DID list, or data on the DID list is lacking, the substance is documented in accordance with test method no. 301 A–F or no. 310 in the OECD guidelines for testing of chemicals, or other equivalent test methods evaluated by an independent body and controlled by Nordic Ecolabelling.*

*** In accordance with the DID list, version 2016 or later. If the substance is not on the DID list, or data on the DID list is lacking, the substance is documented in accordance with ISO 11734, ECETOC no. 28 (June 1988) or OECD 311 or other equivalent test methods evaluated by an independent body and controlled by Nordic Ecolabelling.*

If information about the substance being hazardous to the environment (in the form of data concerning toxicity and biodegradability, or toxicity and

bioaccumulability) is not available, the substance is treated as a worst case, i.e. as environmentally hazardous, H410.

☒ Report on surfactants that are to be exempted from the requirement (quantity, classification, biodegradability). See Appendix 1 for test requirements.

☒ Summary of the product's content in % by weight of substances classified as H410, H411 and H412.

☒ Appendices 2 (product) and 3 (raw material) signed and completed, or alternatively equivalent signed information.

☒ Calculation according to the above formula showing that the requirement is fulfilled. Nordic Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites.

Background to requirement O11

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 with poor biodegradability may cause environmental problems today or in the future. The effect will be very serious if poorly degradable substances are also toxic. 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 below is connected to classification limits for environmentally hazardous substances (CLP, table 4.1.2, Classification of compounds in terms of the risk of long-term adverse effects by summarising the concentrations of the classified constituents).

Nordic Ecolabelling has decided not to include M-factors, multiplication factors*, in the requirement, since most of the substances included in cleaning products in this product group have M-factor 1. This also entails that substances for which there is no data and for which a "worst case" assessment is made are counted as H410 with M-factor=1.

** An M-factor is applied to the concentration of a substance classified as hazardous to the aquatic environment in the categories of acute 1 and chronic 1, on classification in accordance with CLP*[91].

The product categories look slightly different compared with generation 5, with some categories having been merged. The requirement limit for professional spray products has been tightened to prohibit the use of fragrances, which contribute most to the amount of environmentally hazardous substances.

The new limits are based on data which Nordic Ecolabelling has for products that hold ecolabelling licences. RTU WC products no longer have their own limit value. They are not spray products and may contain perfumes and therefore need

[91] ECHA: http://echa.europa.eu/documents/10162/13643/pg_7_clp_notif_sv.pdf (visited 03.05.2016)

a higher limit. According to license data, there is no reason to distinguish between different non-spray RTU products, and therefore there only is one limit value for other RTU products in this criteria generation.

The vast majority of substances classified as environmentally hazardous can be found in the fragrances, but environmentally hazardous substances can also be found in preservatives, for example. Since professional spray products are not permitted to contain fragrances and we want to further encourage the use of better fragrances, particularly in the products that are used in large quantities (products for the professional market), the level in the professional products is set significantly lower than in the consumer products.

As part of the 2nd ATP to CLP, the basis for environmental risk classification was amended (as from 1 December 2012). Previously, to have the environmental risk classification "long-term environmental effects" (R50/53, R51/53 and R52/53), there had to be evidence that the substance was not readily biodegradable. But in the CLP system, substances can have a risk classification in the "long-term effects for aquatic organisms" (H410, H411, H412) category solely for the substance's chronic toxicity (if data exists), even if the substance is readily biodegradable. This mostly affects surfactants, which often have low toxicity values, but are biodegradable.

There are also other substances, such as the protease enzyme, which are classified as H411 according to the new classification rules. Enzymes are exempted because they are so active that they break down long before they reach watercourses. However, they have positive environmental effects since less surfactants can be used to achieve the same cleaning results when using enzymes.

Nordic Ecolabelling has decided to continue exempting aerobically and anaerobically biodegradable surfactants with the H412 classification (Harmful to aquatic life with long-lasting effects) from the requirement, in the same way as in the criteria for hand dishwashing detergents. It has been decided to grant the same exemption to H411-classified surfactants as to H412-classified ones. Introducing this additional exemption will not give rise to the certification of more toxic formulations than the ones already approved today. The requirement "Classification of the product" will restrict the amount of H411 and H412 classified surfactants to 2,5% and 25%, respectively. In addition, the "Critical dilution volume"-requirement will restrict the content of highly aquatic toxic surfactants.

In future revisions, Nordic Ecolabelling will always review the products in order to assess the need for these exemptions. A decision has been made to investigate the consequences of the following actions on the requirement "Long-term environmental effects":

- All exemptions are removed and all classified substances including surfactants must be included in the calculation, regardless of their classification category (H410, H411 and H412).
- The M-factors for H410-classified substances must be included in the calculation.

Because of these two actions, new limit values will have to be set to expect formulations to meet the new version of the requirement.

Cleaners for textile floors has been calculated to the same limits as concentrated professional products, since the Nordic Ecolabel considers that the same limits should apply for these categories.

Facade and terrace cleaners have the same limits as concentrated cleaners for consumers and professionals. This limit has been set after going through different formulations for this product type. The Nordic Ecolabel considers it to be reasonable to set the same requirement for these product types.

The requirement has been tightened for some product categories compared to generation 5.

O12 CDV – critical dilution volume

The critical dilution volume (CDV) is calculated for all constituent substances included in the cleaning product. CDV is a theoretical value that takes account of each substance's toxicity and biodegradability in the environment.

The product's critical dilution volume (CDV) is calculated on the basis of the highest recommended dose stated on the packaging.

The product's critical dilution volume (CDV) may not exceed the limit values for $CDV_{chronic}$ in table O11.

Table O11. CDV limit values

Category	$CDV_{chronic}$
Concentrated, consumer	10,500
RTU, WC, consumer	600,000
RTU, other, consumer	600,000
Concentrated, professional	9,500
Foam, professional	100,000
RTU, other (incl. WC), professional	3500,000
RTU windows, professional, consumer	48,000
Facade and terrace cleaners	20,000

** Microorganisms are exempted from the CDV calculation.*

CDV is calculated using the following formula for all substances in the product:

$CDV_{chronic} = \sum CDV_i = \sum (dose_i \times DF_i \times 1000 / TF_i \text{ chronic})$

$dose_i$ = the constituent volume of each individual substance "i", in g/l in-use solution

DF_i = degradation factor for substance "i", in accordance with the DID list

TFi chronic = chronic toxicity factor for substance "i", in accordance with the DID list.

If

TF_i chronic is lacking, TF_i acute can be used.

✉ Calculation of $CDV_{chronic}$ for the cleaning product. Nordic Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites

Reference to the DID list, version 2016 or later. If substances are not on the DID list, or data on the DID list is lacking, the parameters must be calculated based on the guidance in part B of the DID list, and the related documentation must be submitted.

Background to requirement O12

CDV is a theoretical value that takes account of each substance's toxicity and biodegradability in the environment. The method was developed together with the EU Ecolabel. A maximum limit for CDV ensures that the Nordic Swan Ecolabelled products have a very small impact on the recipient watercourse.

The critical dilution volume (CDV) is calculated for all ingoing substances included in the cleaning product. Constituent substances are all the substances covered by the definition at the start of the requirement text, plus impurities from raw materials if they make up over 100 ppm of the product or 1,0 % of the raw material and thus qualify for inclusion in the CDV calculation.

The CDV limit is only stated with chronic values, as in generation 5. The use of chronic data is generally preferable, since long-term toxicity data is considered of higher quality and gives more precise/reliable estimates of potential environmental effects compared with acute toxicity data. The requirement specifies that if TFchronic is lacking, TFacute may be used. The safety margins are much larger for acute toxicity values than for chronic values.

The requirement limits for CDV have been harmonised, which has led to tougher limits for certain categories, compared with version 5 of the criteria. The product categories look slightly different compared with generation 5, with some categories having been merged. It is only referred to DID-list from 2016 or later in criteria generation 6.

The new limits are based on data which Nordic Ecolabelling has for products that hold ecolabelling licences. The new EU Ecolabel limit values from the 2017 criteria were also taken into account when setting the limits.

Microorganisms

Microorganisms 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. The effect of enzymes is generally very small in comparison with, for example, the effects of surfactants and fragrances in cleaning products. It is also 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. Microorganisms are also not included on the DID list.

Microorganisms 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. 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.

Cleaners for textile floors and wash polish/wax-and-wash care products (O22) has been calculated to the same limits as concentrated professional products, since the Nordic Ecolabel considers that the same limits should apply for these categories.

Facade and terrace cleaners have CDV ≤ 20000. This limit has been set after going through different formulations for this product type. The Nordic Ecolabel considers it to be a reasonable limit for the product type causing the producers to environmentally optimize their products.

O13 Content of substances which are not aerobically and/or anaerobically biodegradable (aNBO and anNBO)

The product's total content of substances that are not aerobically biodegradable (aNBO) and that are not anaerobically biodegradable (anNBO) may not exceed the limits stated in Table O13 per litre of in-use solution.

The product's aNBO and anNBO are calculated on the basis of the highest recommended normal dose stated on the packaging.

Note that all surfactants must be aerobically and anaerobically biodegradable in accordance with O4. See also the exemption from the requirement of anaerobic biodegradability for substances which are not surfactants (Appendix 1, item 6, Anaerobic biodegradability).

Table O13: Limit values for aNBO and anNBO

Category	aNBO (g/litre in-use solution)	anNBO (g/litre in-use solution)
Concentrated, consumer*	0.10	0.10
RTU, WC, consumer	2.00	5.00
RTU, other, consumer	2.00	2.00
Concentrated, professional*	0.045	0.250
Foam, professional	0.70	0.70
RTU, other (incl. WC), professional	2.00	5.00
RTU windows, professional, consumer	0.70	0.70
Facade and terrace cleaners	0,10	0,010

✉ Calculation of the concentration of aNBO and anNBO for the cleaning product in grams/litre of in-use solution. Nordic Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites

Reference to the DID list, 2016 or later versions. If substances are not on the DID list, or data on the DID list is lacking, the related documentation must be submitted.

Background to requirement O13

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

In some places, sludge is used as a soil improver and in this case, it is important that the sludge contains as low a level of non-readily degradable substances as possible.

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 concerning prohibited 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.

A combination of requirements concerning the amount of non-aerobically degradable substances, non-anaerobically degradable substances and CDV ensures that the total quantity of non-degradable substances and/or toxic substances is limited, but still provides a certain amount of flexibility in the formulation of the products.

The requirement limits for aNBO and anNBO have been harmonised, which has led to tougher limits for certain categories, compared with version 5 of the criteria. The requirement is new for wash polish/wash-and-wax care products for floors. The product categories look slightly different compared with generation 5, with some categories having been merged.

The new limits are based on data which Nordic Ecolabelling has for products that hold ecolabelling licences. The reason for the higher limit for RTU WC products compared with other sub-categories is the thickener.

6.4.3 Performance

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 (O14) or a user test (O15). The laboratory test is the only option for consumer products (O14). Cleaning products for textile floors need to be tested with a user test (O15).

For concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water requirements O11-O13 apply for the diluted final product

O14 Performance test – laboratory test (professional and consumer)

a) The product must, through laboratory testing, demonstrate equal or better cleaning performance, when compared with a reference product in the same product category the product must also clean better than water alone.

   If the product is marketed for both professional and consumer use, it must be tested against a professional product.

   The test must demonstrate the ability to remove soil, in accordance with the description in Appendix 5.

   The test must be performed by a laboratory that meets the requirements concerning test laboratories in Appendix 1 (point 1B).

b) If the product is tested in accordance with the EU Ecolabel's test for all-purpose cleaners and sanitary cleaners (Commission decision of 28 June 2011 or later version), this laboratory test can be used.

✉ Alternative a: Test report containing data on dosing, selection of reference product, description of the test method, description of the soil and soil preparation, selection of surfaces, calculation of EFF (performance index) in accordance with Appendix 5. The report shall demonstrate that the product is equal to or better than the reference product and better than water.

✉ Alternative a: Documentation on the test laboratory demonstrating compliance with the requirements concerning test laboratories in Appendix 1 (point 1B).

✉ Alternative b: Description of how the EU Ecolabel test has been performed and complete results from the test.

O15 Performance test – user test

a) The product must demonstrate cleaning performance that is equal to or better than a reference product within the same product category in 80% of tests.

   The performance of the product is judged on the following three parameters:

   - Ability to remove soil in comparison to the reference product
   - Abrasion to the cleaned surface in comparison to the reference product
   - Effectiveness in comparison to the reference product

   The tests must be performed by at least 5 users. All users/testers must complete Appendix 6a–c (depending on the product category). The applicant must then collate the results according to Appendix 6d or 7b (facade and terrace cleaners).

b) The performance of cleaning products for cleaning of textile floors are judged on the following three parameters:

   - Ability to remove soil in comparison to the reference product
   - Ability to remove stains in comparison to the reference product
   - Effectiveness in comparison to the reference product
   - Abrasion toward the surface in comparison to the reference product
   - The tests must be performed by at least 5 users. All users/testers must complete Appendix 8a. The applicant must then collate the results according to Appendix 8b).

c) If the product is tested in accordance with the EU Ecolabel's test for all-purpose cleaners and sanitary cleaners (Commission decision of 28 June 2011 or later version), this user test can be used.

✉ Alternative a) for all surface cleaners and kitchen cleaners, sanitary and WC cleaners and glass/window cleaners: Description of how the test is performed, plus all fully completed questionnaires (Appendix 6a–c), plus a summary of the responses (Appendix 6d).

✉ Alternative b for textile floor cleaners and facade and terrace cleaners: Description of how the test is performed, plus all fully completed questionnaires (Appendix 7a or 8a), plus a summary of the responses (Appendix 7b or 8b).

✉ Alternative c: Description of how the EU Ecolabel test has been performed and complete results from the test.

Background to requirements O14 and O15 Performance

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 (O14) or a user test (O15). The laboratory test is the only option for consumer products (O14). 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.

The testing instructions for both the laboratory and the user test were updated in the previous revision of the criteria (version 5) to make them clearer and to ensure clearer documentation of the product's effectiveness. Three amendments have been made in this revision (version 6):

- The test laboratory requirements have been updated.
- There is now a specification that the reference product in the laboratory test may be from the same manufacturer as the product for which a licence is being sought.
- The section on soil types has been updated. New product groups have been added, as well as a requirement that the products must be tested for all the soil types for which they are marketed. For WC cleaners, there is a specification that the soil type must be limescale.

The amendments are explained in more detail below.

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 and not with a consumer kitchen spray. The reference product must be a product that is well-established/well-known in the market. 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 1 of the criteria.

In version 5 of the criteria, the laboratory requirement for the performance test was that it must meet the general requirements of standard EN ISO 17025 or have official GLP status. In version 6, Nordic Ecolabelling also accepts tests from other competent and independent testing institutes. In version 5 of the criteria, Nordic Ecolabelling allowed the use of the applicant's own laboratory, under certain conditions. In version 6, Nordic Ecolabelling wishes to make it even more acceptable for the manufacturers to use their own laboratories for performance testing.

The applicant's own laboratory, and external testing institutes that do not meet EN ISO 17025 or have official GLP status, may be approved to carry out performance tests. The following conditions must be met:

- The organisation must be ISO 9001 certified or certified according to the International Features Standards (IFS) standard for Household and Personal Care.
- The test laboratory must be covered by the certification, and the performance test must be included in the quality management system.
- Nordic Ecolabelling is to be given access to all the raw data from the performance test.

The applicant's own laboratory may be approved to carry out performance tests even if the test laboratory and the performance test are not covered by ISO 9001 or IFS standard for Household and Personal Care certification. The following conditions must be met:

- The organisation must have a quality assurance system, and the performance test must be described in that system.
- Nordic Ecolabelling is to be given access to all the raw data from the performance test.
- The laboratory must document that the test method used is aimed at differentiating between different cleaning products in the same category and with the same area of use, and that the results achieved are reproducible.
- It must be possible for Nordic Ecolabelling to come and observe the performance of a test.

The instructions for the laboratory test can be found in Appendix 6.

In this version, Appendix 7, section 2 (reference product) specifies that the manufacturer may compare the product in the application with another product that they make. This is on condition that their own reference product is well-known on the market and has the same area of use as the product in the licence application.

In this version, Appendix 7, section 4 (soil) now states that 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 (e.g., soil containing protein and starch). We have also

added the product types oven cleaner and wash-polish/wash-and-wax care products to Table 1. The soil type fat has been removed from the test requirements for sanitary cleaners and WC cleaners. The products are almost all acidic. Several testing institutes have pointed out that it is difficult to differentiate between the fat-removing properties of the various products in this category. The soil type lime soap has also been removed from WC cleaners, so they now only have to be tested for limescale. Several testing institutes have reported that they usually test WC cleaning products only for limescale, and that lime soap is not likely to be a common soil type in a toilet.

Facade and terrace cleaners have been added as a new category in the appendix for test instructions. After dialogue with stakeholders the soil types have been chosen to be soot, fat, oil, asphalt and biological material. A clarification has also been added stating that products claiming biocidal effects such as products killing algae can not be labelled according to section "What can carry the Nordic Swan Ecolabel".

The user test involves the product being sent out, along with a questionnaire (Appendices 6a–d, 7a–b and 8a–b of the criteria), to a selection of testers/companies who test the product at least 5 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
- Abrasion of the cleaned surface
- Effectiveness

For products containing microorganisms, Appendices 6a–d now have an extra question about the long-term effect of the product compared with other products. This is to indicate whether the microorganisms have an additional effect.

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.

A new appendix has been added for the user testing of wash polish/wash-and-wax care products for floors, since this was not present in the previous version. Oven cleaners are included in the appendix for all-purpose cleaners and kitchen cleaners.

A new appendix has also been added for cleaning products for textile flooring as a user test where the product is being compared to a similar product. Cleaning products for textile flooring are judge according to the following parameters:

- Ability to remove soil in comparison to the reference product
- Ability to remove stains in comparison to the reference product
- Effectiveness in comparison to the reference product
- Gentleness toward the surface in comparison to the reference product

An appendix for facade and terrace cleaners has also been added as a user test where the test is to show that the product is as good or better than a similar product. The product is to be judged on the following parameters:

- Ability to remove soil in comparison to the reference product
- Abrasion to the cleaned surface in comparison to the reference product
- Effectiveness in comparison to the reference product

The EU Ecolabel's test for "Hard-surface cleaning products" was updated to the new criteria that were published in June 23, 2017. Version 5 of the Nordic Swan Ecolabelling criteria approved the previous version of the EU Ecolabel's performance test and this version of the Nordic Swan Ecolabelling criteria will accept tests carried out in line with the EU Ecolabel's testing instructions from June 23, 2017.

6.5 Wash polish/wash-and-wax care products

O16 Classification of the wash polish/wash-and-wax care product

The product must not be classified as shown in Table O16:

Tabell O16 Classification of the product

CLP Regulation 1272/2008		
Classification	**Hazard Class and Category Code**	**Hazard statement**
Hazardous to the aquatic environment	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Aquatic Chronic 3 Aquatic Chronic 4	H400 H410 H411 H412 H413
Hazardous to the ozone layer	Ozone	H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3 Acute Tox 4 Acute Tox 4 Acute Tox 4 Exception: Professional products can be labelled with Acute toxicity, Category 4 with H332, H312, H302 if the packaging is designed so that the user does not come in contact with the product	H300 H310 H330 H301 H311 H331 H302 H312 H332
Specific target organ toxicity, single or repeated exposure	STOT SE 1 STOT SE 2 STOT RE 1 STOT RE 2	H370 H371 H372 H373

Skin corrosion/irritation	Skin Corr. 1A, 1B or 1C Exceptions: - Products where classification is due to pH.	H314
Aspiration hazard	Asp. Tox. 1	H304
Respiratory or skin sensitisation**	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317 Products labelled with EUH208: "Contains (name of sensitising substance). May cause an allergic reaction." cannot be Nordic Swan Ecolabelled.**

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

*** Exemption from hazard phrase EUH 208 for products containing MI (Methylisothiazolinones) in polymer dispersions/waxes in concentration ≤100ppm in the raw material and ≤15ppm Methylisothiazolinones in the final product causing this hazard statement. Also see requirement O18.*

Please note that the producer/supplier is responsible for the classification.

✉ Safety data sheets for the product in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/E2EC).

✉ Description of the packaging design showing that the user is not in contact with the product for the products for which an exemption is made from the requirement of classification as H332, H312 and/or H302. Documentation in the form of a technical description and user instructions showing how the user avoids contact with the product.

✉ Documentation confirming that the product has been classified as corrosive due to its pH value, if an exemption is made for H314.

Background to requirement O16

The background to this requirement is the same as for O5 for cleaning products, but with the following differences:

For wash polish/wash-and-wax care products the text regarding foam formulations has been removed since that is not relevant for this product type. This refers to requirements on specific organ toxicity and the ban on classification with H318 (eye damage).

For wash polish/wash-and-wax care products an exemption has been made for products containing methylisothiazolinone, causing the product to be labelled with the hazard phrase EUH208 ""Contains (name of sensitising substance). May cause an allergic reaction." The exemption makes it possible for producers of wash polish/wax-and-wash care products to use polymerdispersions/waxes conating MI causing the final product with the EUH208 phrase. The exemption allows Methylisothiazolinones in polymer dispersions/waxes in concentration ≤100ppm in the raw material and ≤15ppm Methylisothiazolinones in the final product, see further under O18.

6.5.1 Requirements for constituent substances

O17 Classification of ingoing substances

Ingoing substances in the product must not be classified as shown in Table O17:

Table O17 Classification of ingoing substances

CLP Regulation 1272/2008		
Classification	**Hazard Class and Category Code**	**Hazard statement**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351**
Mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact	H360 H361 H362
Respiratory or skin sensitisation***	Resp. Sens. 1 Skin Sens. 1	H334 H317

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

*** Exceptions: Complexing agents of the MGDA and GLDA type may contain NTA impurities in the raw material in concentrations of less than 0.2%, if the concentration of NTA in the cleaning product is below 0.1%.*

****The following substances are exempt:*

- Enzymes (including stabilisers and preservatives in the enzyme raw material) can be included if they are in liquid form or granulate capsules.
- Sensitising preservatives, but see also requirement O18 Prohibited substances and O20 Preservatives. The exemption does not apply to foam products.

✉ Safety data sheet for each raw material in line with European legislation (Annex II to REACH, Regulation (EC) No 1907/2006).

✉ Appendix 2 and 3 or equivalent certification completed and signed.

Background to requirement O17

The background is the same as to O6 with the following adjustments:

The exemptions regarding fragrances and microorganisms in O6 has been removed. Fragrances are not allowed in these products and microorganisms are, as far as the Nordic Ecolabel knows, not used in this type of products. Text referring to foam applications has also removed since the requirements are set on concentrated products.

O18 Prohibited substances

The following substances are excluded from use in the product:

- Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD)
- EDTA (Ethylene diamine tetraacetate and its salts) and DTPA (Diethylenetriamine pentaacetate)
- Quarternary ammonium salts that are not readily degradable
- Organic chlorine compounds and hypochlorites

- Methyldibromo glutaronitrile (MG, CAS 35691-65-7)
- Methylisothiazolinone (MI, CAS 2682-20-4)

Exemption: polymer dispersions/waxes in concentration ≤100ppm in the raw material and ≤15ppm Methylisothiazolinones in the final product

- Nitro musks and polycyclic musk compounds
- Phthalates
- Phosphate, phosphonate, phosphonic acid or phosphoric acid

Exemption: ≤ 0,10% phosphorous is accepted in wash polish/wash-and-wax products

- VOC

  Volatile organic compounds are defined in accordance with the European Commission's directive 1999/13/EC on the limitation of emissions of volatile organic compounds with steam pressure > 0.01 kPa at 20°C.

  Exemption for isopropanol and ethanol

- Fluorine surfactants and other per- and polyfluorinated compounds (PFC)
- BHT (butylated hydroxytoluene, CAS 128-37-0)
- D4 (octamethylcyclotetrasiloxane, CAS 556-67-2),
- D5 (decamethylcyclopentasiloxane, CAS 541-02-6),
- D6 (dodecamethylcyclohexasiloxane, CAS 540-97-6)
- Microplastics

Microplastic means particles with a size of below 5 mm of insoluble macromolecular plastic, obtained through one of the following processes:

(a) a polymerisation process such as polyaddition or polycondensation or a similar process using monomers or other starting substances;

(b) chemical modification of natural or synthetic macromolecules;

(c) microbial fermentation.

- Note that foils/films wrapping tablets and similar generating microplastics may not be Nordic Swan Ecolabelled.
- Substances that are considered potential endocrine disruptors in category 1 or 2, according to official lists within the EU. The EU's report on endocrine disruptors can be read in full at http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf (Appendix L, page 238 onwards)
- Substances evaluated by the EU to be PBT (persistent, bioaccumulative and toxic) or vPvB (very persistent and very bioaccumulative), in accordance with the criteria in Annex XIII of REACH and substances that have not yet been investigated, but which meet these criteria.
- Substances judged to be "Substances of very high concern", which are included on the Candidate List: https://echa.europa.eu/candidate-list-table.
- Nanomaterials/particles

  Nanomaterials/particles are defined in accordance with the European Commission's definition of nanomaterials dated 18 October 2011: "A natural, incidental or purposely manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for at least 50% of the particles in the number size distribution, one or more external dimensions are in the size range of 1-100 nm." Examples are ZnO, TiO2,

SiO2, Ag and laponite with particles of nanosize in concentrations exceeding 50%. Polymer emulsions are not considered to be nanomaterial.

✉ A duly completed and signed declaration of compliance with the requirement, Appendix 2 or similar documentation for the product, Appendix 3 or similar signed documentation for the raw materials.

Background to requirement O18

The background is the same as in O7, with the following differences:

In O18 there is an exemption for wash polish/wax-and-wash care products allowing up to 15ppm MI in the final product due to preservatives containing MI in wax/and polymer emulsions (i.e., waxes that are not 100% wax raw materials). A total ban of MI in this product type would make it very difficult for the producers to produce well-working products without MI. The limit is set to 15ppm since the product above that limit will be classified as sensitising, which is not something the Nordic Ecolabel wants to have.

In requirement O18 there is an exemption for 0,10% phosphorous in the products. This limit was 0,20% in generation 5 of the criteria. This is for example used as a plasticizer.

The requirement regarding microplastics in O18 has been extended with the following text: *Note that foils/films wrapping tablets and similar emitting microplastics may not be Nordic Swan Ecolabelled.*

O19 Fragrances

Fragrances and fragrances in plant extracts must not be present in wash polish/wax-and-wash-products.

✉ Appendix 2 and 3 or equivalent certification completed and signed.

Background to requirement O19

The Nordic Ecolabel prohibits fragrances in wash polish/wax and wash care products in the same way as in generation 5 of the criteria. This product type is for the professional market where it can lead to unwanted exposure of the cleaning staff, which the Nordic Ecolabel wants to limit.

The same requirement as in generation 5.

O20 Preservatives

a) Preservatives included in the product or constituent substances must not be bioaccumulative. Preservatives are judged not to be bioaccumulative if BCF < 500 or logKow < 4. If both values are available, the value for the highest measured BCF is to be used, see appendix 1.

b) Sensitising preservatives are permitted to a maximum of 100 ppm. Note that requirement O5 and O6 must also be fulfilled.

Note that methylisothiazolinone (MI, CAS 2682-20-4) is forbidden in the products in requirement O18.

✉ a) Documentation of BCF or logKow, Appendix 2 and 3 or similar documentation completed and signed and safety data sheet for the preservative.

✉ b) Calculation of the amount of ingoing sensitising preservatives in the final product.

Background to requirement O20

The background to this requirement is the same as in O9, with the addition of exemption for 15ppm of MI in the final product.

6.5.2 Ecotoxicity and biodegradability

In all calculations, the highest recommended normal dose must be used. A higher dose is often indicated for special purposes, that are not performed daily. That dosage does not need to be taken into account in calculations. The water in the toilet is never included as a part of the in-use solution.

O21 Long-term environmental effects

The use of constituent substances which are classified with any of the hazard statements H410, H411 or H412 including self-classification in the ECHA database is limited as follows:

$FV < LV$

$FV = 100 * CH_{410} + 10 * CH_{411} + CH_{412} \leq LV$ grams/litre in-use solution

where

FV = Factor value

LV = Limit value, see table O21

CH_{410} = concentration of substances with H410 in grams/litre in-use solution

CH_{411} = concentration of substances with H411 in grams/litre in-use solution

CH_{412} = concentration of substances with H412 in grams/litre in-use solution

The product's FV is calculated on the basis of the highest recommended normal dose stated on the packaging.

Table O21 Limit values for environmentally hazardous substances

Category	Limit value (LV) (g/l in-use solution)
wash polish/wax-and-wash-products	0.0020

Exemptions:

- Protease/Subtilisin classified as Aquatic Chronic 2 (H411) is exempt from the requirement, see also the requirement concerning enzymes in O17.
- Surfactants classified as H411 and H412 are exempted from the requirement, on condition that they are readily biodegradable* and anaerobically biodegradable**.

  ** In accordance with the DID list, version 2016 or later. If the substance is not on the DID list, or data on the DID list is lacking, the substance is documented in accordance with test method no. 301 A–F or no. 310 in the OECD guidelines for testing of chemicals, or other equivalent test methods evaluated by an independent body and controlled by Nordic Ecolabelling.*

  *** In accordance with the DID list, version 2016 or later. If the substance is not on the DID list, or data on the DID list is lacking, the substance is documented in accordance with ISO 11734, ECETOC no. 28 (June 1988) or OECD 311 or other*

equivalent test methods evaluated by an independent body and controlled by Nordic Ecolabelling.

If information about the substance being hazardous to the environment (in the form of data concerning toxicity and biodegradability, or toxicity and bioaccumulability) is not available, the substance is treated as a worst case, i.e., as environmentally hazardous, H410.

☒ Report on surfactants that are to be exempted from the requirement (quantity, classification, biodegradability). See Appendix 1 for test requirements.

☒ Summary of the product's content in % by weight of substances classified as H410, H411 and H412.

☒ Appendices 2 (product) and 3 (raw material) signed and completed, or alternatively equivalent signed information.

☒ Calculation according to the above formula showing that the requirement is fulfilled. Nordic Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites.

Background to requirement O21

The background is the same as in O11. The limit for wash polish/wax-and wash care products is the same as for concentrated professional products since the Nordic Ecolabel considers the same limits to work for this product type as well.

O22 CDV – critical dilution volume

The critical dilution volume (CDV) is calculated for all constituent substances included in the cleaning product. CDV is a theoretical value that takes account of each substance's toxicity and biodegradability in the environment.

The product's critical dilution volume (CDV) is calculated on the basis of the highest recommended dose stated on the packaging.

The product's critical dilution volume (CDV) may not exceed the limit values for $CDV_{chronic}$ in table O22.

Table O22. CDV limit values

Category	$CDV_{chronic}$
Wash polish/wax-and-wash-products	9,500

**Substances in wash polish/wash-and-wax care products for floors with a molecular weight > 700, max diameter > 1.17 nm and a max molecular length > 4.3 nm and toxicity > 100mg/l are not included in the calculation. See however O18 Microplastics.*

CDV is calculated using the following formula for all substances in the product:

$CDV_{chronic} = \sum CDV_i = \sum (dose_i \times DF_i \times 1000 / TF_i \text{ chronic})$

$dose_i$ = the constituent volume of each individual substance "i", in g/l in-use solution

DF_i = degradation factor for substance "i", in accordance with the DID list

TFi chronic = chronic toxicity factor for substance "i", in accordance with the DID list.

If

TF_i chronic is lacking, TF_i acute can be used.

✉ Calculation of $CDV_{chronic}$ for the cleaning product. Nordic Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites.

✉ Reference to the DID list, version 2016 or later. If substances are not on the DID list, or data on the DID list is lacking, the parameters must be calculated based on the guidance in part B of the DID list, and the related documentation must be submitted.

Background to requirement O22

The background to this requirement is the same as in O12, with the following addition:

There is an exemption for high molecular weight substances that are not toxic. High molecular weight substances can be very slow to biodegrade. High molecular weight substances are substances that, due to their size, have limited bioavailability since they are not easily transported through biological membranes. They are a major component of wash polish/wash-and-wax care products for floors. High molecular weight substances that have a toxicity of over 100 mg/l are exempt from the requirement regarding CDV.

O23 Content of substances which are not aerobically and/or anaerobically biodegradable (aNBO and anNBO)

The product's total content of substances* that are not aerobically biodegradable (aNBO) and that are not anaerobically biodegradable (anNBO) may not exceed the limits stated in Table O23 per litre of in-use solution.

The product's aNBO and anNBO are calculated on the basis of the highest recommended normal dose stated on the packaging.

Note that all surfactants must be aerobically and anaerobically biodegradable in accordance with O4. See also the exemption from the requirement of anaerobic biodegradability for substances which are not surfactants (Appendix 1, section 6, Anaerobic biodegradability).

Table O23: Limit values for aNBO and anNBO

Category	aNBO (g/litre in-use solution)	anNBO (g/litre in-use solution)
Wash polish/wax-and-wash products	0.045*	0.250*

**Substances in wash polish/wash-and-wax care products for floors with a molecular weight > 700, max diameter > 1.17 nm, a max molecular length > 4.3 nm and toxicity > 100mg/l are not included in the calculation. See however O18 Microplastics.*

✉ Calculation of the concentration of aNBO and anNBO for the cleaning product in grams/litre of in-use solution. Nordic Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites

Reference to the DID list, 2016 or later versions. If substances are not on the DID list, or data on the DID list is lacking, the related documentation must be submitted.

Background to requirement O23

The background to this requirement is the same as in O13, with the following differences:

There is an exemption for high molecular weight substances that are not toxic. High molecular weight substances can be very slow to biodegrade. High molecular weight substances are substances that, due to their size, have limited bioavailability since they are not easily transported through biological membranes. They are a major component of wash polish/wash-and-wax care products for floors. High molecular weight substances that have a toxicity of over 100 mg/l are exempt from the requirement regarding aNBO and anNBO.

The requirement limits for aNBO and anNBO have been harmonised, which has led to tougher limits for certain categories, compared with version 5 of the criteria. The requirement is new for wash polish/wash-and-wax care products.

6.5.3 Performance

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 wash polish/wax-and-wash products, the applicant can choose between conducting a laboratory test (O24) or a user test (O25). The laboratory test is the only option for consumer products (O24).

O24 Performance test – laboratory test (professional and consumer)

The product must, through laboratory testing, demonstrate equal or better cleaning performance, when compared with a reference product in the same product category the product must also clean better than water alone.

The test must demonstrate the ability to remove soil, in accordance with the description in Appendix 5.

The test must be performed by a laboratory that meets the requirements concerning test laboratories in Appendix 1 (point 1B).

✉ Test report containing data on dosing, selection of reference product, description of the test method, description of the soil and soil preparation, selection of surfaces, calculation of EFF (performance index) in accordance with Appendix 5. The report shall demonstrate that the product is equal to or better than the reference product and better than water.

✉ Documentation on the test laboratory demonstrating compliance with the requirements concerning test laboratories in Appendix 1 (point 1B).

O25 Performance test – user test (professional products)

The product must demonstrate cleaning performance that is equal to or better than a reference product within the same product category in 80% of tests.

The performance of the product is judged on the following three parameters:

- Ability to remove soil in comparison to the reference product
- Abrasion toward the surface in comparison to the reference product
- Effectiveness in comparison to the reference product

The tests must be performed by at least 5 users. All users/testers must complete Appendix 9a. The applicant must then collate the results according to Appendix 9b).

✉ Description of how the test is performed, plus all fully completed questionnaires (Appendix 9a), plus a summary of the responses (Appendix 9b).

Background to requirement O24 and O25

The background to this requirement is the same as for O14 and O15 for cleaning products.

The difference for wash polish/wax-and-wash care products is that the Nordic Ecolabel has chosen to adjust the questions to better suit this product type. The questions in appendix 9 (in the criteria) have been 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.

6.6 Packaging

The EU has chosen to work in line with the idea of the circular economy and adopted an action plan[92] that has a clear focus on recovery and recycling, particularly with regard to packaging material. The principle is based on promoting the alternatives that give the best overall outcome for the environment. Collecting waste can either lead to a high level of material recovery, where valuable materials are returned back into the economy, or to an ineffective system where recyclable waste largely ends up in landfill or is sent for incineration. The notion of waste appears to be undergoing something of a transformation, so that it is now more about resources that can be used for new products. This puts a greater focus on the design of products because the design affects how well a product can be recycled. The design also affects how valuable the collected recovered material might be.

EU has now accepted a plastic strategy[93] focusing on making recycling of plastics more profitable, reduce the use of single use plastic products, stop the littering of oceans, push investments and innovations regarding minimization of waste and work toward global solutions and standards to reduce the amounts of plastic used.

The Plastic strategy also states that the EU commission will work toward more requirements on packaging design to improve recycling. On page 7 in the plastic strategy[94] it says: "To support improved design while preserving the internal market, EU action is essential. The Commission will work on a revision of the essential requirements for placing packaging on the market[95]. The objective will be to ensure that, by 2030, all plastics packaging placed on the EU market is reusable or easily recycled[96]. In this context, the Commission will also look into ways of maximising the impact of new rules on Extended Producers Responsibility (EPR) and support the development of economic incentives to

[92] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 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
[93] EU, Plastic Waste: a European strategy to protect the planet, defend our citizens and empower our industries, 2018, http://europa.eu/rapid/press-release_IP-18-5_en.htm (besökt 2018-01-24)
[94] EU, Plastic Waste: a European strategy to protect the planet, defend our citizens and empower our industries, 2018, http://europa.eu/rapid/press-release_IP-18-5_en.htm (besökt 2018-01-24)
[95] Directive 94/62/EC on Packaging and Packaging Waste.
[96] i.e. it can be recycled cost-effectively.

reward the most sustainable design choices. It will also assess the potential for setting a new recycling target for plastic packaging, similar to those put forward in 2015 for other packaging materials."

In Europe, the demand for plastics stood at 49 million tonnes in 2015, 40% of which was for packaging material, followed by construction material at 20%. Practically all of the plastic packaging was intended for single use[97].

In this new generation, Nordic Ecolabelling wishes to set requirements that ensure products can be recycled to a greater extent, so that the recovered materials can be used again, thus contributing to the circular economy. With its waste management hierarchy, the EU's Waste Framework Directive sets out an order of priority for legislation and policies aimed at preventing and managing waste, and this hierarchy is often illustrated using the waste pyramid. The most important priority is to prevent waste, followed by reuse, recycling, energy recovery and disposal. The aim is for waste to be managed as close to the top of the hierarchy as possible. In "Closing the loop – An EU action plan for the Circular Economy"[98], greater recycling and material recovery is highlighted as a key aspect of the circular economy. Nordic Ecolabelling therefore feels that it is important to have requirements concerning material recovery.

Although the circular economy underscores the importance of a high level of recyclability, it should not be forgotten that in environmental terms, the gains and impact that the packaging system entails must be seen in the context of the whole value chain. The main function of packaging is, of course, to ensure that the product reaches the end user and can be used as intended. However, small adjustments to the packaging can have a major influence on sorting and recycling. So, in order to contribute to greater circularity, it is important to bear in mind recycling technology considerations. Although (from an LCA perspective) packaging tends to be seen as a minor part of the overall environmental impact that an individual product type might have, Nordic Ecolabelling sees considerable relevance, potential and steerability in contributing to a high degree of circularity by setting packaging requirements. The criteria contain several packaging requirements, all of which have three core objectives:

1. To stimulate greater collection of packaging for recycling.
2. To stimulate greater use of the plastic currently collected in the production of new products. This is driven primarily via the WUR requirement, but also by requiring that virgin plastic must not be coloured, in order to stimulate a more closed circle.
3. To stimulate an improvement in the quality of the collected and recycled material. This is driven, for example, by specific requirements restricting filler levels, colourants and undesirable combinations of materials in packaging, closures and labels.

But is there an environmental justification for recycling plastic? Or could it be worse for the climate, for example, to recycle than to manufacture new plastics? In 2015, the Nordic Council of Ministers published a report, "Climate benefits of

[97] Swedish Society for Nature Conservation 2017, Rätt plast på rätt plats – om svårnedbrytbar plast I naturen och plastens roll I den cirkulära ekonomin.
[98] Closing the loop – An EU action plan for the Circular Economy, EU Commission 2015 http://eur-ex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0001.02/DOC_1&format=PDF

material recycling – Inventory of Average Greenhouse Gas Emissions for Denmark, Norway and Sweden", whose results indicated that, in CO_2eq, there may be climatic benefits from recycling plastic. The size of those gains is, however, related to the choice of material and the recycling method used, and the results of the study cannot be used as a precise measure of the scale of the gains. Nevertheless, the report's conclusion is that:

"The emissions from secondary production are lower for all materials, implying that both the difference and the percent variance between secondary and primary production are negative[99]*."*

Although an ecocycle-based approach is not entirely new, the recycling of plastic appears, to some extent, to be in its infancy. There are many projects under way, and we are set to see enormous progress in this area. Nordic Ecolabelling is aware that everything could change but hopes that the newly formulated packaging requirements will provide a good baseline that in the future can be adapted, expanded or redefined depending on what future systems look like.

About the recycling of plastic packaging

Different materials have different NIR reflections (near infrared reflectance), densities and melting points. Packaging comprises several components, such as bottle, closure and label, and each of these may be made from one or more different materials. According to Swedish recycling collection service FTI's report "En plastmolekyls livsresa, ÅTERVINNING AV PLASTFÖRPACKNINGAR – SÅ HÄR FUNGERAR DET" (A plastic molecule's journey through life, RECYCLING OF PLASTIC PACKAGING – HOW IT WORKS), hard plastic packaging is sorted with the help of infrared (NIR) scanners, which identify what type of plastic each item of packaging is made from. The IR scanner communicates with a mechanical separator that operates with great precision to divert each item onto the right conveyor belt depending on its type. The sorted packaging fractions then go on to be ground, washed, dried and melted into granules[100]. However, the NIR detector has its limitations, since it has problems identifying products that are dark colours. In fact, pigments such as furnace black can take away any chance of the NIR detector identifying the material[101]. The sorting is not based entirely on NIR. There is also a separation process that uses a water bath, and in this context the various densities of the plastics are a key factor. One example is that the addition of calcium carbonate quickly changes the density of the packaging, and this also affects the separation process[102],[103]. Another density-related example is that labels and closures on PET bottles should have a density of less than 1 g/cm^3 for optimal separation. PET has a density of 1.38, which means that the material sinks in water. Having closures and labels with a density of less than 1 ensures optimal separation[104]. This can be compared with the reverse

[99] Nordic Council of Ministers, Tema Nord 2015:547, Climate benefits of material recycling – Inventory of Average Greenhouse Emissions for Denmark, Norway and Sweden, page 74.
[100] FTI AB, PLASTFÖRPACKNINGAR, En plastmolekyls livsresa, ÅTERVINNING AV PLASTFÖRPACKNINGAR – SÅ HÄR FUNGERAR DET.
[101] Förpacknings- och Tidningsinsamlingen, Plastförpackningar – En återvinningsmanual version 0.7, June 2017.
[102] Förpacknings- och Tidningsinsamlingen, Plastförpackningar – En återvinningsmanual version 0.7, June 2017.
[103] http://www.plasticsrecycling.org/pp sourced on 08.08.2017
[104] http://www.plasticsrecycling.org/pp sourced on 08.08.2017

situation for PP bottles, for example. PP has a density of less than 1 and so the label's density should be above 1 g/cm^3 [105].

So how is the melting point relevant in this context? One example may be that a small amount of HDPE in a PP fraction might not be too much of a problem, whereas the converse, with small amounts of PP in an HDPE fraction can cause major damage. This is because PP has a higher melting point than HDPE, which creates problems during granulation of the recovered material. If the HDPE fraction is then used, for example, to extrude pipes, the presence of PP will cause lower stability and cracks in the pipes [106].

Nordic Ecolabelling have set requirements on packaging to increase the possibility to recycle the material to make the materials be reused and there contribute to circular economy. Requirements O26-O29 are requirements on the primary packaging such as bottles, containers, pouches, cardboard boxes etc. The requirement regarding recycling design has been divided into two requirements, one for pouches (O27) and one for other types of packaging (O26). For foam/spray products there is an additional requirement, O29.

For concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water both the refill packaging and the "mother" packaging must meet the packaging requirements. If the product is not marketed together with a "mother" packaging with contents, but if the label or other communication refers to a specific packaging, bottle or similar, which should be used for dilution, this is referred to as a "mother" packaging. If the packaging format, in which the product is to be diluted is not specified at all, the packaging requirements apply only for the packaging of the concentrated product.

O26 A - Recycling design of packaging and closures (excluding pouches)

Plastic packaging of less than 200 liters should have a design that enables material recovery. This means that:

- The plastic packaging and closure must be made from Polyethylene (PE), Polypropylene (PP) or Polyethylene terephthalate (PET).

Exemption is made for spray triggers that can contain following plastics in small technical details: polyoxymethylene (POM), expanded polyethylene (EPE), ethylene butyl acrylate copolymer (EBA), synthetic rubber copolymer of acrylonitrile and butadiene (NBR), and up to 6% Ethylene vinyl acetate (EVA).

Exemption is made for PE- or PP-closures that are used in squeeze bottles. The closures can contain a TPE (thermoplastic elastomer)-membrane of the type TPE-PE (based on polyethylene), TPE-PP (based on polypropylene) or SEBS (Styrene-Ethylene-Butylene-Styrene thermoplastic elastomer). If the closure is to be used on a PET-bottle, the membrane must have a density below 1.0 g/cm^3.

- PS (polystyrene) and PVC (polyvinylchloride) or plastics based on other types of halogenated plastics must not be present in the closure.

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

- Packaging should be white or uncoloured. Exemption: packaging containing recycled plastic (postconsumer recycled) may be coloured/tinted. The colouration may not include carbon black.

Exemption is made for small amounts of carbon black used in other colours than black. It must then be documented that the NIR sensor reads and sorts the box/bottle/container or the closure to the correct plastic fraction.

- Carbon black pigments cannot be added to the closures. Exemption is made for small amounts of carbon black used in other colours than black. It must then be documented that the NIR sensor reads and sorts the box/bottle/container or the closure to the correct plastic fraction.
- Fillers (such as CaCO3) cannot be included in PE or PP packaging and closures at a level that the density of the plastic exceeds 0.995g / cm3
- Metal parts must not be part of packaging or closure.
  There is, however, an exemption for parts for foam triggers as well as other parts of the foam function in foam bottles, which are sold together with refill packs on the professional market. Small metal parts in pumps are also exempted (both for professional and consumer, with or without refill).
- Packaging and closures must be compatible with each other, in accordance with the following:
  - PET: closures must have a density of less than 1 g / cm^3.
  - Silicon closures are not allowed
  - PP and PE:
  - Silicon closures are not allowed
  - PE: PP/OPP- closures are not allowed unless the following test or similar is stated on the packaging: “Take the cap/closure off prior to recycling to improve recycling”.

Packaging includes bottles, containers and similar. Closures includes caps/lids, dosage equipment and pumps mounted on the packaging.

☒ Packaging specifications (including bottle and closures) or certificate showing the plastic used and what colours the packaging and closure have.

☒ Appendix 4 declaration from the manufacturer of the packaging.

☒ A signed declaration of compliance with the stated material composition for the packaging, including bottle, closure, filler, colorant where applicable, Appendix 4 or an equivalent declaration may be used.

☒ A calculation showing that the density measurement is not exceeded.

☒ Label showing text regarding instruction to remove the cap before recycling, where applicable.

O26 B - Labels for rigid plastic packaging: Design for recycling of packaging

- For containers in polyethene (PE) and polypropene (PP): The following label materials are permitted:
  - Polyolefin plastic labels (PE and PP) as well as PET or PET-G labels with density > 1.0 g/cm3. For labels of different material than the packaging, the suitability must be substantiated in

accordance with Recyclass' Recyclability Evaluation Protocol for labels and adhesives on HDPE containers, version 1.0[107].

Exemption: Fold-out (cross-over) labels of PP if the label does not cover more than 50% of the packaging surface for sizes ≤ 500 ml and 70% for sizes > 500 ml.

- Paper labels without fibre loss. The suitability must be substantiated in accordance with Recyclass' Washing quick test procedure: For paper labels applied on HDPE & PP containers, standard laboratory practice, version 1.0[108].

- Containers in polyethylene terephthalate (PET) must have a label of a different plastic material, with a density < 1.0 g/ cm3, or a paper label without fibre loss.
  - Paper labels without fibre loss: The suitability must be substantiated in accordance with Recyclass' Washing quick test procedure: For paper labels applied on HDPE & PP containers, standard laboratory practice, version 1.0[109].

Note: PET-G is not allowed in labels on PET containers. For the time being, cPET labels are also not permitted. Nordic Ecolabelling will consider allowing cPET-labels with the appropriate specifications, if cPET labels become endorsed by EPBP (The European PET Bottle Platform) for PET bottles and/or by RecyClass (www.recyclass.eu).

- Polystyrene (PS), polyvinyl chloride (PVC) and other halogenated plastics must not be used in labels.
- Metallized labels/shrink film labels are not permitted.
- For labels of different material than the packaging:
- Labels must not cover more than 60% of the container. The calculation of the percentage shall be based on the two-dimensional profile of the container i.e., the area of the top and bottom of the packaging and the sides of a box/ container/bottle/can shall not be included in the calculation. If the label on the front of pack and back of pack are of different size, the maximum percentage of 60% shall be fulfilled for each side separately. For a cylindrical bottle, the calculation can also be based on the three-dimensional profile exclusive bottom and top of the bottle.
- Direct print on the container is not permitted except for date codes, batch codes and UFI (Unique Formula Identifier).

Label means "traditional label", shrink film label/sleeve, direct print etc.

Please note: Nordic Ecolabelling conducted a project on labels in 2020 and concluded that requirements on labels should be included in the criteria. This requirement was introduced in 2021. More information can be found in the background document under the argumentation regarding requirement O26B. During 2024, RecyClass replaced the Washing quick test procedure for film labels applied on HDPE & PP containers with Recyclability Evaluation Protocol for labels and adhesives on HDPE containers. A corresponding evaluation protocol for PP is expected to be published in 2025, whereby the criteria will be updated with a reference to this protocol.

[107] https://recyclass.eu/wp-content/uploads/2024/07/REP-HDPE-02.pdf (Accessed on 2024-12-19)
[108] https://recyclass.eu/wp-content/uploads/2021/10/RecyClass-Washing-QT-Procedure-for-Paper-Labels-applied-on-HDPE-and-PP-Containers_FINAL.pdf (Accessed on 2021-11-19)
[109] https://recyclass.eu/wp-content/uploads/2021/10/RecyClass-Washing-QT-Procedure-for-Paper-Labels-applied-on-HDPE-and-PP-Containers_FINAL.pdf (Accessed on 2021-11-19)

In the next revision of the label requirement, it is expected that PE and PP packaging must have a label made of the same material, and that paper labels will no longer be permitted.

✉ Label specifications showing the material used and density. Appendix 4 Declaration from the manufacturer(s) of the packaging can be used as part of the documentation.

✉ If plastic labels of different material than the container is used on PE or PP containers. Test report from a laboratory fulfilling the conditions in Appendix 1, showing that the label is approved.

✉ If paper labels are used: Test report from a laboratory fulfilling the conditions in Appendix 1, showing that the label is approved.

✉ Declarations that PS, PVC and other halogenated plastics, aluminium and other metals have not been used. Appendix 4 can be used.

✉ For labels of different material than the packaging: Calculation of label size compared to the surface of the container.

✉ Declaration from the applicant that direct print is not used except for date codes, batch codes and UFI. Appendix 2 can be used.

Background to requirement O26A + O26B

The EU Ecolabel has a section on Packaging in its criteria for "Hard-surface cleaning products", which were adopted on 23 June 2017. The technical report v 3.0 emphasises the importance of packaging being designed for effective recycling by avoiding potential impurities and combinations of materials that prevent separation of different materials, or that reduce the quality of the recovered material. Packaging that is easiest to be recycled will use only one material, but unfortunately this is not always the best solution from a transport or dosing perspective. This is why there is no requirement prohibiting combinations of different materials. In the EU Ecolabel's criteria work it became apparent that in many cases combinations of different materials can allow the overall quantity of material to be reduced, which is a particularly important consideration. This in turn can lead to reduced transportation and landfill, which can be a significant issue in countries with a low level of recycling and a lack of recycling facilities. The EU Ecolabel's work resulted, however, in packaging requirements that focus on supporting recycling as the best method of waste management, and thus on how setting a requirement can help to make packaging easier to recycle. The Nordic countries have a recycling system for packaging (although the systems vary slightly), so Nordic Ecolabelling has chosen to follow the EU Ecolabel's example. Consequently, Nordic Ecolabelling has chosen to introduce more or less the same requirements as the EU Ecolabel with regard to "Products sold in spray bottles", "Take-back systems for packaging" and "Recycling design".

Some adjustments were made to the requirement in January 2020 as the requirement was harmonized with the same requirement in criteria for laundry detergents and stain removers.

Bottle

"Plastförpackningar – En återvinningsmanual från FTI" (Plastic Packaging – A recycling manual from FTI) 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.[110]. Since these types of plastic are considered to be the best (from a recycling perspective), Nordic Ecolabelling also sets requirement that the plastic bottles should be made from these plastic materials.

After the public consultation a separate requirement for products sold in pouches has been added, since there were questions from producers whether they should fulfil the same requirements as other packaging. See more regarding thus under requirement O27.

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 are PS and PVC or plastics based on other types of halogenated plastics not allowed in the closure or label either.

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.

TPE based on TPE-PE, TPE-PP and SEBS is allowed as membranes in squeeze-bottle closures made of PE or PP. These are compatible with PE/PP, hence small amounts will not disturb the recycling process or quality. Membranes on closures attached to PET-bottles must have a density < 1.0 g/cm^3, in order to separate from the PET during the sink/float process[111].

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, including the use of 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 the requirement that plastic packaging, including closures must not be black.

[110] Förpacknings- och Tidningsinsamlingen, Plastförpackningar – En återvinningsmanual version 0.7, June 2017.
[111] Correspondence with Sina Lystvet, Grønt Punkt Norge, 2021-01-08

During the public hearing comments from FTI were that packaging that is white or uncoloured is the best choice when it comes to recycling, since such packaging does not cause problems during scanning/sorting of the bottles and also make the reusage of the plastic more attractive. Other recyclers state the same regarding white and transparent packaging, since they cannot remove the pigments before recycling. The Nordic Ecolabelling has after the public hearing decided to exclude black coloured closures. For the packaging the Nordic Ecolabel has however chosen to go one step further and only allow white and clear packaging. A quick screening on the web showed that the main part of the packages for cleaning products were transparent or white.

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 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.

* *The recycled plastic here refers to Post-Consumer Recycled plastic to harmonize with the WUR requirement.*

Label

The Nordic Ecolabelling has after the public hearing chosen not to set specific requirements on the labels, but will start a label "investigation", see below. The goal is to be able to set requirements on labels by 2021 to improve the recyclability further.

Nordic Ecolabelling knows that there are large environmental problems connected to labels used on different packaging. Many comments during the hearing also showed that different producers have chosen different ways when it comes to what labels to put on what bottle. There are also national differences in how the producers have chosen types of labels.

When it comes to recycling the best alternative is when the label is made of the same material as the bottle. 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. The paper fibres adversely affect the properties of the recycled material (since the water bath is unable to remove all the paper fibres from the plastics stream) and cause an unpleasant odour[112]. Paper labels can also cause problems in the sorting step. If the NIR hits the label instead of the packaging the entire packaging will end up in the rejected fraction.

After the public hearing Nordic Ecolabelling has had discussions on whether to exclude sleeves, ie labels covering the whole bottle, since they cause problems during sorting of the plastic materials. A requirement has now been added to

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

limit the labels to cover a maximum of 60% of the surface of the packaging. The limit of 60% has been set since that is the limit recyclers[113] suggest.

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

An exemption for fold-out (cross-over) labels of PP on PE containers was added in line with a RecyClass Technical Review on labels and sleeves.[114] This allows fold-out labels made of PP material on PE containers as long as they do not exceed the size limits.

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[115], [116]. 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 metal is not recycled as metal, it does not interfere with plastic recycling. However, pumps help with controlled dosing.

Compatibility

EU Ecolabel has a requirement on labels, shrink film labels and closures should have a density less than 1 g/cm^3 which has been backed up by EU Ecolabel Technical report[117]. In the draft sent out on public consultation the Nordic Ecolabelling had a similar requirement on the density of labels, but this has been removed after the consultation period. Nordic Ecolabelling will start a project to evaluate labels and their effect on the recycling process, see above.

The consultation draft of the criteria for Disposables for food (2017) proposed a maximum limit of 20% inorganic filler in plastic. The consultation draft was, however, amended following feedback from Grønt Punkt in Norway and FTI in Sweden, and subsequent exchanges, since such a large amount of inorganic filler affects the ability to recycle such items. This is because the 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

[113] Grönt Punkt, Basic Facts Report on Design for recycling, 2017, https://www.grontpunkt.no/media/2777/report-gpn-design-for-recycling-0704174.pdf (visited 2018-01-29)
[114] RecyClass Technical Review, 2024, https://recyclass.eu/wp-content/uploads/2024/01/Technical-Review-Labels-and-sleeves-Sorting.pdf (accessed 2025-05-16)
[115]Plaskretsen and FTI, Bättre förutsättningar för återvinning av plastförpackningar.
[116] http://www.plasticsrecycling.org/hdpe sourced on 08.08.2017
[117] JRC Technical Reports, Revision of six EU Ecolabel Criteria for detergents and cleaning products http://susproc.jrc.ec.europa.eu/detergents/docs/Technical%20background%20report.pdf, 2016

requirement that filler must not be added to the HDPE to such a level that its density exceeds 1 g/cm^3 and to PP in such level that the density exceeds 1 g/cm^3.

Nordic Ecolabelling had a requirement, during the hearing, 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[118],[119]. 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[120]. During the consultation period comments were received showing that 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. The producers also 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. HDPE has for example better properties at low temperatures and can handle impact better, which is a requirement for UN goods*. Nordic Ecolabelling has therefore chosen to remove this ban and have instead added 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.

*UN products are products classified as "dangerous goods" during transport

This is a new requirement that was not included in the preceding generation.

The label project and O14B

The label requirements are based on the findings in a label project run by Nordic Ecolabelling in the summer/autumn of 2020 for laundry detergents, cleaning products and hand dishwashing detergents. The requirement was introduced into the criteria 2021 and enters into force after a transition period. Key players within the recycling industry in Sweden (FTI), Finland (Uusiomuovi), Norway (RoAF, Mepex, Norner, Grønt Punkt Norge) and Denmark (Plastindustrien) were consulted, in order to ensure relevant requirements with respect to the current Nordic waste streams. Furthermore, major label producers and suppliers, as well all Nordic Swan Ecolabel licensees within the above-mentioned product categories were consulted, to ensure achievable requirements.

PE and PP containers should preferably have labels of the same plastic material, in order to facilitate correct sorting by the NIR sensor. However, other label materials are accepted due to the current market situation. Removable labels are preferred, in order to avoid decreasing the final quality of the recyclate further, by introducing different polymers in addition to adhesive and inks. Therefore passing RecyClass' Recyclability Evaluation Protocol for labels and adhesives on HDPE containers is required.During 2024, RecyClass replaced the Washing quick test procedure for film labels applied on HDPE & PP containers with Recyclability Evaluation Protocol for labels and adhesives on HDPE containers. A

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

corresponding evaluation protocol for PP is expected to be published in 2025, whereby the criteria will be updated with a reference to this protocol.

In the next revision of the label requirement, it is expected that PE and PP packaging must have a label made of the same material, and that paper labels will no longer be permitted.

Moreover PET and PET-G labels must have a density > 1.0 g/m3, to be separated from the PE and PP containers in the float/sink bath. Paper labels must be without fibre loss because residue paper fibres cause quality issues in the recycled plastic.

PET labels must have labels with density <1.0 g/ml 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. Nordic Ecolabelling will consider to allow cPET-labels with the appropriate specifications, if cPET labels become endorsed by EPBP (The European PET Bottle Platform) for PET bottles and/or by RecyClass (www.recyclass.eu). Paper labels must be without fibre loss because residue paper fibres cause quality issues in the recycled plastic.

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.

If the NIR sensor at the sorting facility hits the label instead of the bottle, the bottle may end up in the rejected fraction. Therefore, labels and shrink film labels of different materials than the container must not cover more than 60% of the container surface.

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.

This is a new requirement introduced March 2022.

O27 Recycling design of pouches/plastic bags

- The plastic packaging and closure must be made from Polyethylene (PE), Polypropylene (PP) or Polyethylene terephthalate (PET).
- The packaging should be made of monomaterial, i.e. not laminates with layers of different materials.
- Silicone, PS and PVC or plastics based on other types of halogenated plastics must not be present in the closure or label.
- Carbon black pigments cannot be added to the pouch or closures. Exemption is made for text and pictograms. Exemption is also made for

small amounts of carbon black used in other colours than black. It must then be documented that the NIR sensor reads and sorts the pouch or the closure to the correct plastic fraction.

- Fillers (such as $CaCO_3$) cannot be included in PE or PP packaging and closures at a level that the density of the plastic exceeds 0.995g / cm^3.
- Barrier coatings can only be made of EVOH (Ethylene vinyl alcohol) in maximum amounts of 5% related to the total weight.

Closures includes caps and lids. The packaging includes pouches or other plastic "bags".

A transition period is introduced for this requirement. The requirement is obligatory from 2021-09-01.

☒ Packaging specifications (including pouch, labels and closures) or certificate showing the plastic used and what colours the packaging and closure has.

☒ Appendix 4 declaration from the manufacturer of the packaging.

☒ A signed declaration of compliance with the stated material composition and barrier coatings, for the packaging including pouch, closure, filler, colourant where applicable, Appendix 4 or an equivalent declaration may be used.

☒ A calculation showing that the density measurement is not exceeded.

Background to requirement O27

During the public consultation period questions arose regarding products sold in pouches and whether they should fulfil the same packaging requirements as bottles and containers when it comes to recycling design. Nordic Ecolabelling chose to include a new requirement for this type of packaging to avoid making O26 too complicated. The requirement is the same as for bottles on plastics.

Nordic Ecolabelling has had dialogues with FTi regarding pouches. They suggested only accepting pouches of PE since they are the easiest to recycle, but since this is the first generation of this requirement Nordic Ecolabelling has decided to use the same requirements on plastics as in O14 for bottles/containers etc. An extra requirement has been added regarding not allowing laminates of different material layers, i.e., the pouches should be made of monomaterials. A transition period until 2021-08-31 was introduced in version 6.3, because the availability of monomaterial pouches is currently limited.

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 mean that these are also excluded.

The requirements on colour and fillers are the same as for bottles (O26).

Some adjustments were made to the requirement in January 2020 as the requirement was harmonized with the same requirement in criteria for laundry detergents and stain removers.

O28 Weight-Utility Ratio (WUR)

WUR is a measure of the amount of packaging used to deliver an amount of product with a certain benefit.

The exemptions from WUR calculation are:

- Packaging made from more than 80% post-consumer recycled (PCR)* raw material is exempted from the requirement.
- Products that are supplied in packaging that is part of a take-back system** for a product.

** Post-consumer/commercial recycled material is defined in the requirement according to ISO 14021:2016:*

"Post-consumer/commercial" is defined as material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

*** Take-back system refers to packaging that are taken back, washed and refilled. Packaging that is a part of a recycling system where the packaging is recycled into new plastic is not part of what here is called a take-back system.*

The calculation of WUR (grams of packaging/litre of in-use solution) is performed as follows:

$WUR = \Sigma [(2*Vi - 2.5*Ri)/(Di * ti)] \leq$ limit value in table O28

Vi = Weight of primary packaging in grams, including closure, fitted dosing devices and similar + any refills (that are sold per original bottle) in grams including closures.

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

> Packaging is considered postconsumer recycled if the raw materials are recovered following use by consumers. If the raw material is industrial waste from the material or packaging producer's own production, the material is not considered to be recycled.

Di = No. of functional doses in the primary packaging component (i). For products that are sold pre-diluted, D = product volume (in no. of litres).

If the primary packaging is sold packaged together with a refill, D is calculated as the sum of the functional doses in both packs (just as V is the sum of the weight of both packs (see description of V)).

ti = Reuse factor. This is 1 + the number of times the packaging component (i) is reused (through the sale of refills). t = 1 if the packaging component is not reused for the same function (disposable packaging).

t > 1 may only be used if it can be documented that the packaging is reused several times for the same purpose.

Table O28 WUR limit values

Produkt type	VNF limit (grams of packaging/litre of in-use solution)
Foam/spray products	175,0
Other RTU products	150,0
Concentrated cleaning products including wash polish/wax-and-wash-care products and façade and terrace cleaners	1,0
Concentrated products for refill for RTU bottles which are always diluted at least 10 times by the	30

user to the finished product with a certain amount of water *	

**Note that if the refill is dosed as a unit containing a water-soluble foil intended not to be removed before diluting, the foil must be part of the product formulation in the requirements dealing with CDV, environmental hazards and aNBO and anNBO. (O11-O13). If the product is not marketed together with a "mother" packaging with contents, but if the label or other communication refers to a specific packaging, bottle or similar, which should be used for dilution, this is referred to as a "mother" packaging. WUR for this "mother" packaging is calculated as if the packaging were filled with finished product.*

☒ Declaration/documentation from the packaging manufacturer stating the type of material in the packaging components (e.g., closure (cap, spray nozzle etc.), bottle and labels). Appendix 5 can be used.

☒ Calculation of weight-utility ratio (WUR) and required documentation on reuse of the packaging component. Nordic Ecolabelling's calculation sheet can be used and can be obtained from Nordic Ecolabelling's websites

☒ Declaration from the packaging manufacturer about the proportion of recycled material, if recovered/recycled material is used. Appendix 4 can be used.

☒ If t >1: Documentation in the form of sales statistics or similar showing how many refills are sold per original packaging.

☒ If the exemption is used:

- Documentation that shows that packaging made of more than 80% post-consumer recycled (PCR) material (Appendix 4 can be used).

or

- Documentation that shows is part of a take-back system for a product.

Background to requirement O28

The purpose of the weight-utility ratio (WUR) is to reduce the amount of packaging and promote the use of recycled materials, 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 has been made stricter at 1.0 for concentrated products, 175 for spray products and 150 for other ready-to-use products, as it has become

apparent that the limit was very easy to meet, particularly for concentrated products. In addition, in this generation of the criteria a weighting factor of 2.5 has been added to the WUR calculation, in order to promote the use of recycled material in the packaging. The aim is to stimulate the choice of packaging that uses recycled raw materials. The factor has been chosen so that if you have 80% recycled material, WUR = 0. Packaging made from more than 80% post-consumer recycled (PCR) raw materials is thus exempted from the WUR calculation, as in the EU Ecolabel. It appears to be a suitable way to try to encourage a high proportion of recycled packaging material. However, even a small amount (e.g., 5%) of recycled material helps to meet the requirement if you are on the borderline. The availability of packaging made from recycled raw materials is apparently low in the Nordic market, but Nordic Ecolabelling believes there is the utmost relevance in trying to stimulate greater recycling. A definition of post-consumer/commercial recycled material was added to the requirement in January 2020.

Since the relevance is high but the Nordic availability (of recycled plastic raw material for this type of plastic packaging) is currently limited[121], there is no absolute requirement that the packaging must be made from a certain amount of recycled raw material. There are, however, sources in other parts of Europe

(Benelux, UK, France)[122]. The WUR calculation may be incorporated via changes to several parameters, but in this generation of the criteria recycled material is given a slightly higher weighting than before. The purpose of the weighting is to simulate increased demand for plastic packaging from recycled plastic.

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.

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

In the Nordic market, it is currently difficult to steer consumers towards buying refills, in particular for spray products, and many supermarket chains are unwilling to give shelf space to refills. In the previous generation of the criteria, the applicant has estimated how many refills are sold per mother bottle and used that figure to show compliance with the WUR requirement. But since not all stores stock refills for all products, this estimate is rarely a good reflection of reality. The limit for ready-to-use products such as sprays has therefore been set so that it is possible to meet the requirement without refills, if the packaging is not very heavy and contains a large amount of the product, making it more optimised.

[121] Telephone conversation with Pernilla Kulleborn 02.06.2017.
[122] Telephone conversation with Pernilla Kulleborn 02.06.2017.

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 WUR calculation for wash polish/wash-and-wax care products for floors has been harmonised with other cleaning products.

The letter N has been changed, after the public consultation, to the letter R in the equation above, since this factor stands for the amount of recycled material in this generation of the criteria. In the previous generation the factor with letter N was the amount of virgin material in the packaging. Nordic Ecolabelling has chosen the letter R as recycling. The text above has therefore been changed to the following:

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

In this generation of the criteria, the WUR requirement includes 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 remarkably.

In February 2020 Nordic Ecolabelling decided to adjust requirements so that it was specified that concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water can be Nordic Ecolabelled. The new WUR limits are based on data from manufacturers.

The requirement has been tightened compared to generation 5

O29 Spray products and concentrated products for refill for RTU bottles – Packaging

a) Sprays that use a propellant must not be used.

b) Foam/spray products: all spray products must have a permanent foaming nozzle. Alternatively, other aerosol-reducing devices as aerosol-reducing formulation in the form of a viscous product). This is acceptable if there is a test showing that the amount of inhalable, thoracic and respirable aerosol is at least as low for the test product in its ordinary packaging compared to a reference product with a mesh foamer. The reference product must be a Nordic Swan Ecolabelled product with for example a mesh foamer. The chemical composition and physical properties of the reference product must be equivalent to the cleaning product that is the subject of the licence application. The test must be performed according to “Bestemmelse av inhalerbar, torakal og

respirabel aerosolfraksjon" as described in Olsen et al. (2017)[123]. The test must be performed by a laboratory that meets the requirements concerning test laboratories in Appendix 1 (point 1A).

c) Packaging for concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water must be designed so that the user does not come in contact with the product when diluting.

d) For concentrated products for refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water: If it is communicated on the label or in any other way that the product can be used in a spray bottle, but there is no reference to a specific spray bottle, the following text must be included: "The spray bottle must have a foaming nozzle to protect the user's health".

☒ a: Documentation that propellant is not used, e.g., description of the packaging

☒ b: Declaration/documentation from the manufacturer of the spray trigger, stating that it has a permanent foaming nozzle.

Alternatively

☒ b: Description of the aerosol-reducing device and a report from the test of the aerosol reducing device in comparison with a reference product with mesh foamer if relevant.

☒ b: Documentation regarding the test laboratory in accordance to appendix 1.

☒ c: Description of the packaging design showing that the user is not in contact with the product when diluting. Documentation in the form of a technical description and user instructions showing how the user avoids contact with the product.

☒ d: Label showing the text "The spray bottle must have a foaming nozzle to protect the user's health".

Background to requirement O29

Requirement a) Cleaning sprays with propellant differ from trigger sprays in that the container is metal and the products contain propellants that are often flammable. The market share for cleaning sprays with propellant is low, so the potential is low. Nordic Ecolabelling has thus chosen to exclude such product formats in this version, without investigating the environmental impacts in detail compared with trigger spray products.

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

Use of a spray forms a spray mist, which the user may breathe in. This increases the risk that the user will be exposed to allergens.

[123] 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://brage.bibsys.no/xmlui/bitstream/handle/11250/2433134/STAMI-rapport%2Bnr%2B%2B2%2B2017.pdf?sequence=2

Several studies suggest a link between cleaning sprays and asthma in adults[124]. The amount of health-related aerosol fractions – inhalable, thoracic and respirable – in the spray mist can be significantly reduced by using a foaming nozzle.[125], [126].

Spray products without a foaming nozzle or equivalent aerosol-reducing device will now no longer be eligible for the Nordic Swan Ecolabel. Overall, the requirements in generation 6 have thus been brought into line with the requirements for spray products in generation 3 of the criteria for the Nordic Swan Ecolabelling of cleaning services, so that Nordic Swan Ecolabelled cleaning sprays for professional use can be used by Nordic Swan Ecolabelled cleaning services. Many bathroom and kitchen sprays on the consumer market already have a foaming nozzle.

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 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.

The test must be performed in accordance with "Bestemmelse av inhalerbar, torakal og respirabel aerosolfraksjon" as described in Olsen et al. (2017)[127], The test must be performed at a laboratory fulfilling the requirements stated in section 1A in appendix 1.

Requirement c) To minimize the risk to the user of the refill for RTU bottles which are always diluted at least 10 times by the user to the finished product with a certain amount of water, 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 mother bottle.

The requirement is new in generation 6.

6.7 Environmental management and regulatory requirements

Quality and regulatory requirements are general requirements that are always included in Nordic Ecolabelling's product criteria. The purpose of these is to

[124] Siracusa A, De Blay F, Folletti I, Moscato G, Olivieri M, Quirce S, Raulf-Heimsoth M, Sastre J, Tarlo SM, Walusiak-Skorupa J,Zock J-P. Asthma and exposure to cleaning products – a European Academy of Allergy and Clinical Immunology task force consensus statement. Allergy 2013; 68: 1532–1545.
[125] 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

[126] Personal contact with Raymond Olsen, STAMI, 2017
[127] 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

ensure that fundamental quality assurance and applicable environmental requirements from the authorities are dealt with appropriately. They must also ensure compliance with Nordic Ecolabelling's requirements for the product throughout the period of validity of the licence.

These requirements have been changed to match the standard wording in the criteria template.

To ensure that Nordic Ecolabelling requirements are fulfilled, the following procedures must be implemented.

O30 Responsible person and organisation

The company shall appoint individuals who are responsible for ensuring the fulfilment of the Nordic Ecolabelling requirements, for marketing and for finance, as well as a contact person for communications with Nordic Ecolabelling.

✉ Organisational chart showing who is responsible for the above.

O31 Documentation

The licensee must archive the documentation that is sent in with the application, or in a similar way maintain information in the Nordic Ecolabelling data system.

🔑 Checked on site as necessary.

O32 Quality of the cleaning product

The licensee must guarantee that the quality of the Nordic Swan Ecolabelled product does not deteriorate during the validity period of the licence.

🔑 The claims archive is checked on site.

O33 Planned changes

Written notice must be given to Nordic Ecolabelling of planned changes in products and markets that have a bearing on Nordic Ecolabelling requirements.

✉ Procedures detailing how planned changes in products and markets are handled.

O34 Unplanned nonconformities

Unplanned nonconformities that have a bearing on Nordic Ecolabelling requirements must be reported to Nordic Ecolabelling in writing and journalled.

✉ Procedures detailing how unplanned nonconformities are handled.

O35 Traceability

The licensee must be able to trace the Nordic Swan Ecolabelled product in the production. A manufactured / sold product should be able to trace back to the date (time and date) and the location (specific factory), as well as the relevant machine / production line where it was produced. In addition, it should be possible to link the product with the actual raw material.

✉ Description of/procedures for the fulfilment of the requirement.

O36 Legislation and regulations

The licensee shall ensure compliance with all applicable local laws and provisions at all production facilities for the Nordic Swan Ecolabelled product,

e.g., with regard to safety, working environment, environmental legislation and site-specific terms/permits.

✉ Duly signed application form.

🔑 The requirement is checked on site. The applicant must be able to describe on on-site inspection to which regulatory authorities they are subject to, as well as the authorities' site-specific conditions and environmental concessions.

7 Areas that are not subject to requirements

The requirement concerning the bioaccumulation of colourants has been deleted. Colourants are added in extremely small quantities and are not considered one of the major environmental concerns in a cleaning product. Colourants are also regulated by the aNBO, anNBO and CDV requirements.

With regard to packaging, requirements concerning DIN labelling, sorting instructions and take-back systems were discussed, but these were considered to lack RPS and so they are not in the criteria.

8 Changes compared to previous version

The key changes compared with the previous version are new packaging requirements, a new requirement concerning sustainable raw materials and palm oil, the ban on MI substances and an amended CDV calculation in line with DID2016. The criteria document has been divided into two sections to clarify what is relevant for cleaning products and for wash polis/wax-and-wash care products. All changes are listed in Table 8.1 below.

Table 8.1 Comparison of requirements for cleaning products in generation 5 and generation 6 of the criteria.

Req. Consultation draft generation 6	Req. Generation 5	Same requirement	Changed	New requirement	Comments
Productgroup definition			X		The product group has been extended to also encompass products for cleaning of textile floors and facade and terrace cleaners (outdoor)
O1 Description of the product	R1, R2, R21		x		The requirements have been merged and amended slightly
O2 Sustainable raw materials	-			X	New requirement with focus on sustainable extraction of raw materials
O3 Palm oil	-			X	New requirement with focus on the origin of palm oil
O4 Surfactants – aerobically and anaerobically biodegradable	R13	X			DID2016
O6 Classification of constituent substances	R4+R5		X		Classification only in line with CLP

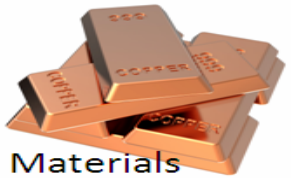
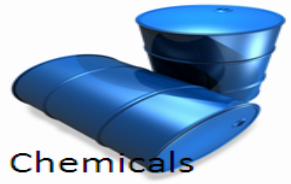
O7 Prohibited substances	R6		X		New substances have been added to the list, including microplastics and PFCs. MI has been added on the list. The exemption for EDTA in solid soap flakes has been removed.
O8 Fragrances	R9		X		9 new fragrances restricted and 3 prohibited.
	R8 Colourants				The requirement has been removd
O9 Preservatives	R7		X		sensitising preservatives restricted. The Challengetest has been removed
O10 Microorganisms	R14	X			
O11 Long-term environmental effects	R10		X		Req. limit tightened and harmonised, product types merged

O12 CDV	R11		X		DID2016, req. limit tightened and harmonised, product types merged
O13 aNBO and anNBO	R12		X		Req. limit tightened and harmonised, product types merged
O14 Performance test – laboratory test	R15		X		Requirement on test lab adjusted
O15 Performance test – user test	R16		X		Requiremenst on test lab adjusted
O16-O25			X		Requirements for wash polish/wax-and-wash care products have their own section.
O26-O27 Recycling design	R17		X	X	New requirements to promote the circular economy.
O28WUR	R19		X		Req. limit tightened and new factor that promotes the use of recycled materials added
	R18 DIN labelling				The requirement on DIN labelling has been removed from generation 6.
O29 Spray products – Packaging				X	Trigger must have a mesh foamer
	K20 Take back system				The requirement on take bake system has been removed
O30-O36 Quality and regulatory requirements	R20, R22–R28		X		Quality and regulatory requirements have been changed to match the standard wording in the criteria template.

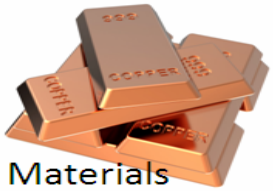
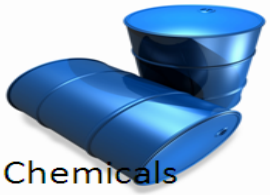
In the above table it is stated that some requirements have been removed since generation 5. Such requirements are R8 colourants, R18 DIN-labelling and R20 Take back systems, see also section 7.

Appendix 1 MECO

1a MECO/MEKA for concentrated cleaning products

MECO/MEKA: **Cleaning agents products for consumer and professional use.** **Functional unit:** **1 wash = 10 liter of water**					
 Materials	Extraction and refining and synthesis from petrochemical raw materials (oil/gas) Growing, harvesting and refining of biobased raw materials (palm kernal oil, forestry (cardboard), etc) Use of land area and petrochemical reserves.	Production and manufacturing of plastics and plastic components. Additives, softeners and other chemical treatment. Surface treatment included. Production of machinery and other equipments.	Diesel oil for distribution	Water consumption ~ 10 l/wash It is ≈ 17 wash per kg cleaning agents Use consumer: 6 g/liter water = 60 g/ wash Use professional: 2,5 g/liter water = 25 g/wash Raw materials for electricity production	
 Energy	Use of energy for extraction/growing, refining and manufacturing of raw materials & packaging. Inherent energy in feedstock and packaging materials. Total energy for raw materials: ~ 0,4 MJ/wash consumer ≈ professional	Production and manufacturing of final products including packaging. Packaging per wash: Materials include PE and PP ~ 0,33 MJ/wash consumer ~ 0,14 MJ/wash professional	Energy for distribution of products (and raw materials etc.) Assumed 5,000 km in a truck. ~ 1,6 MJ primary energy/wash cons ~ 0,7 MJ primary energy/wash prof Energy consumption at retailer < 0,01MJ/wash	Electricity for heating of 10 l water: 0,5 kWh/wash ~ 4,5 MJ primary energy/wash Energy for water supply: ~ 0,04MJ	Energy for wastewater treatment (10 l) ~ 0,1MJ. Potential energy recovery from sludge is negligible. Recycling (with avoided production of virgin materials) or energy recovery from packaging materials. Here calculated as incineration with energy recovery (75% loss in incinerator): Bottle consumer: ~ -0,1 MJ/wash Bottle prof: ~ -0,04 MJ/wash
 Chemicals	Potential emissions from extraction and manufacturing of raw materials.	Handling of chemicals in production – risk of exposure in the working environment. Potential emissions from production (cleaning of tanks and risk of unintented spills). Probably of minor importance in a life cycle perspective for the total consumption of cleaning agents.		Risk of expusure to chemical substances in handeling of products and substances left on cleaned plates etc. E.g. sensitizing substances.	Emmisions of chemical substances after wastewater treatment – and in a few cases without wastewater treatment. E.g. AOX (if chlorine in products) and not degraded chemicals from the detergent and rinsing agents.
 Other	Labour and workplace conditions at plantation? Impacts on nature from changes in land area – risk of net emissions of carbon from deforrestation.		Particulate matter and other emissions from distribution vehicles.		

1b MECO diagram for RTU cleaning products

MECO (MEKA): **RTU (Ready To Use) Cleaning Agents.** **Functional unit: 1 liter RTU**					
 Materials	Extraction and refining and synthesis from petrochemical raw materials (oil/gas) Growing, harvesting and refining of biobased raw materials (palm kernel oil, forestry (cardboard), etc) Use of land area and petrochemical reserves.	Production and manufacturing of plastics and plastic components. Additives, softeners and other chemical treatment. Surface treatment included. Production of machinery and other equipments.	Diesel oil for distribution	Bottles and refills: All calculations assume 1 liter of product.	
 Energy	Use of energy for extraction/growing, refining and manufacturing of raw materials & packaging. Inherent energy in feedstock and packaging materials. Total energy for raw materials: ~ 8,1 KJ/liter RTU	Production and manufacturing of final products including packaging. Packaging per wash: Materials include PET+PP or PE-HD+PP ~ 12,8 MJ/1 RTU Bottle ~ 6,0 MJ/1 RTU Refill	Energy for distribution of products (and raw materials etc.) Assumed 5,000 km in a truck. ~ 28,0 MJ primary energy/1 RTU Bottle ~ 26,4 MJ primary energy/1 RTU Refill	Electricity for heating: Not relevant	Energy for wastewater ~ 0,01MJ. Potential energy recovery from sludge is negligible. Recycling (with avoided production of virgin materials) or energy recovery from packaging materials. Here calculated as incineration with energy recovery (75% loss in incinerator): ~ -3,7 MJ/1 RTU Bottle ~ -1,7 MJ/1 RTU Refill
 Chemicals	Potential emissions from extraction and manufacturing of raw materials.	Handling of chemicals in production – risk of exposure in the working environment. Potential emissions from production (cleaning of tanks and risk of unintented spills). Probably of minor importance in a life cycle perspective for the total consumption of cleaning agents.		Risk of expusure to chemical substances in handeling of products. E.g. sensitizing substances. Risk of allergy and asthma.	Emmisions of chemical substances after wastewater treatment – and in a few cases without wastewater treatment. E.g. AOX (if chlorine in products) and not degraded chemicals from the detergent and rinsing agents.
 Other	Labour and workplace conditions at plantation? Impacts on nature from changes in land area – risk of net emissions of carbon from deforrestation.		Particulate matter and other emissions from distribution vehicles.		

1C Assumption and simplifications in the above MECO diagram

The following applies to both MECO diagrams:

Data on raw materials is taken from Ecoinvent[128], personal communications with producers and articles regarding energy consumption, such as water purification.

Transport distances are estimated as 5000 km.

Waste handling in both cases assumes incineration at 75% efficiency.

Concentrate

Product compositions are based on one all-purpose cleaner for consumers and one for professionals.

Consumer products are calculated based on an average dosage of 6 g/l water and professional products using a dosage of 2.5 g/l water.

The heating of water is based on heating 10 l of water to 45°C.

It is assumed that packaging primarily comprises PE. Calculations are based on one-litre packaging. Packaging sizes for professional products are generally larger, and while packaging provides an energy contribution, this gives a worst-case calculation.

RTU

The RTU composition is based on a pre-diluted consumer all-purpose cleaner in spray bottle.

It is assumed that 1 litre in-use solution has a mass of 1 kg.

No water heating is included.

It is assumed that packaging primarily comprises PET+PP. Calculations are based on one-litre packaging. The calculations include one refill in the packaging values. The refill is assumed to use the same materials as the original bottle but without the spray nozzle.

[128] Database linked to LCA tool.