

# **Nordic Ecolabelling of Cleaning Products**

## **Background to ecolabelling**

**15 March 2018**

# **Nordic Swan Ecolabelled cleaning products – Background to ecolabelling**

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## **Appendix**

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# 1 Summary

Nordic Ecolabelling has established that the most significant parameters for cleaning products are:

- the health and environmental hazard of ingredients
- dosage and performance
- packaging

Several changes have been made in this version of the criteria compared to version 4. The most significant changes are:

- Changed limit values for CDV (critical dilution volume R11) and biodegradability (R12). The sole use of chronic data for CDV calculations.
- New limit value for weight-utility ratio (WUR) for ready-to-use products (R18).
- Prohibition on phosphorous (R6).
- Prohibition on fragrances in professional products (R9).
- Changed calculations and changed limits for environmentally hazardous substances (R10).
- Prohibition on substances of very high concern, vPvB substances and PBT substances (R6).
- Tightened requirements regarding allergens in spray products (R5 and R9).
- Updated performance test. The user test is only applicable to professional products, while laboratory testing can be used for both professional and consumer products (R14 and R15).
- New/updated subcategories, which are found in all requirements.

The performance tests and associated appendices have been updated to clarify the demands of the performance test.

## 2 Basic facts about the criteria

### Products eligible for labelling

The product group definition from version 4 has been retained in this version of the criteria. The criteria are primarily intended for general cleaning products and not products for special cleaning.

The product definition in the criteria is as follows:

*The product group encompasses cleaning products intended for indoor, general and regular cleaning of the following areas:*

- *fixed surfaces (floors, walls, ceilings, doors, tiles and windows (windowcleanrs for both indoor and outdoor are included))*
- *kitchen equipment (for example windows, work surfaces, kitchen cabinets, stoves)*
- *sanitary installations (toilets, baths, showers, wash basins, cabinets)*
- *Wash polish and wash-and-wax care products are also included in the product group*

Product types that the criteria are intended for:

*Professional products (products are considered professional if more than 80% of sales are to the professional market) and/or consumer products can be labelled. Product categories are listed below.*

### Product categories

Previous versions have sorted the product categories differently under different requirements. The subcategories listed below in this version have been clarified to simplify the application process and so that the categories can be found in the same way throughout the criteria document.

Cleaning products containing microorganisms which are used to clean fixed surfaces (floors, walls etc.), either as concentrates or as RTU-products (Ready to use) for the professional, market are included in the product group. Spray products (or products marketed to be used with a spray application) containing microorganisms are not included in the product group.

*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 flooring, walls, ceilings, windows, kitchen work surfaces, tiles, sanitary porcelain (toilets and bathtubs) and showers. Tablets/capsules for toilets are included in this category.*

*Ready-to-use, professional:* *Professional products that are pre-diluted and ready for use. This category includes products for kitchens, bathtubs and showers, but not for large areas\* such as floors.*

*Ready-to-use WC, professional:* *Professional toilet cleaners that are pre-diluted and ready for use straight from the package. This category only includes products for use on toilets and excludes cleaners for other sanitary porcelain and bathroom cleaners.*

*Ready-to-use window cleaner, consumer and professional:* *Professional window and glass cleaners that are pre-diluted and ready for use straight from the package.*

*Concentrated, consumer:* *Concentrated products that require dilution with water prior to use that are designed for the consumer market. This category contains products for all the aforementioned surfaces in*

*the home, such as flooring, walls, ceilings, windows, kitchen work surfaces, , sanitary porcelain and showers. Tablets/capsules for toilets are included in this category.*

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

*Ready-to-use, consumer (other): Pre-diluted consumer products that are ready to use without dilution. This category includes products for kitchens, bathrooms and showers, but not on large areas\* such as floors.*

*Wash polish/wash-and-wax: combined cleaning and polish improvers. They contain care products: film-forming components such as polymers, resin and/or wax. Wash-and-wax care products qualify as maintenance products*

*\*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 local cleaning.*

To clarify what kind of products and product types that are included in the different categories there are descriptions below how to deal with products with multiple usage or different dilution ratios.

***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 spray 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 toilet and bathroom cleaner (walls and floor) must fulfil the requirements of each applicable category.

## **Ready-to-use products**

Ready-to-use (RTU) products that are pre-diluted at the time of purchase have been the subject of considerable discussion. Nordic Ecolabelling has performed an internal investigation regarding such products.

The investigation was started during the latest revision of the criteria for cleaning products. The premise was that the requirements for RTU products were more lenient than those on concentrated products, and generally more lenient for consumer products than for professional products.

The conclusion of this investigation was that RTU products and concentrated products are used on different types of surfaces and in different ways. The investigation suggests that professional concentrated products are used for larger areas and are dosed either with a dispenser or a measure. Consumers use vacuum cleaners more frequently for large areas and use concentrated products for cleaning. RTU products are primarily used for small surfaces such as toilets, kitchens, windows and bathroom fittings, while concentrated products are diluted and used for large areas such as floors.

The advantage of RTU products include having the right concentration from the start and not having to prepare an in-use solution. In comparison, with concentrated products,

the user must add the correct quantity of cleaner to a given quantity of water. Another advantage is that on use only the quantity that is required for that task is used. By comparison, it is commonplace that too much solution is mixed from a concentrated product and that the surplus is thrown out after the task is completed.

The major disadvantages of RTU products are the unnecessary transport of water and health aspects. Less water is transported in connection with concentrated products since these are diluted on use while RTU products contain that quantity of water. The health aspects of RTU products relate primarily to spray products since exposure to aerosol is very different from that when adding concentrate to a bucket of water. RTU sprays are also often used in enclosed spaces such as bathrooms increasing the exposure of the user to the aerosol and its contents.

The market for RTU products is large, above all on the consumer market. If Nordic Ecolabelling should choose not to label such products a relatively large market segment would be entirely omitted which would reduce the overall environmental benefit of the criteria for cleaning products. The requirements on RTU products are stringent in this version of the criteria, above all regarding sensitization, packaging and CDV, to ensure that only the best products with regard to the environment and health fulfil Nordic Ecolabelling requirements.

### **Products that are not eligible for labelling as cleaning products**

During the revision period it has been evaluated whether cleaning wipes should be included in this product group. Wipes are often made of paper or textile and dampened with water and chemicals suitable to their intended area of use. The most common wipes are used for personal hygiene, such as baby wipes and face wipes. These are included by Nordic Ecolabelling criteria for cosmetics. There are also wipes intended for cleaning solid surfaces. Cleaning wipes are available on both professional and consumer markets. Consumer products are available for cleaning kitchens, bathrooms, toilets, windows and floors. Professional products are available for cleaning professional kitchens, restaurants, bars, hotels, etc. There are also some wipes with antibacterial effect designed for hospitals.

A lifecycle analysis has been performed by the French trade organisations AFISE<sup>1</sup> in collaboration with Procter & Gamble [AFISE, 2004]. Wipes, RTU kitchen spray and a concentrated cleaning product diluted prior to use were compared. The LCA compares the use of the three products over a one-year period. There are however uncertainties regarding the estimation of cleaning habits since there many parameters that vary between households. This makes the study difficult to evaluate. According to the LCA report, it is somewhat unclear whether wipes are comparable with the other products since wipes produce more solid waste than the other products. It is difficult from a single LCA to evaluate the environmental benefits of wipes compared to other cleaning products. The use of cleaning wipes in the Nordic area is limited. In light of the aforementioned reasons, Nordic Ecolabelling continues to omit wipes for the criteria for cleaning products.

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<sup>1</sup> AFISE: Association Française des Industries de la détergence, de l'entretien, de l'hygiène et des produits d'hygiène industrielle.

Version 4 of the criteria excluded scouring creams from the criteria. This version of the criteria allows their inclusion so long as they fulfil all requirements applicable to RTU consumer products. Scouring creams are primarily used to remove fat and stains on a variety of surfaces. There is in general no professional reason to exclude scouring creams so long as they fulfil all requirements on RTU consumer products. Scouring creams are primarily used by consumers.

The consultation draft included products containing microorganisms, with the proviso that this only applied to products for professional use in sanitation facilities such as public toilets. Microorganisms are already used in products on the professional market, and products from a number of manufacturers are available. Products solely for odour control and products for drain cleaning were not included in these criteria, see also below.

Following consultation, Nordic Ecolabelling has chosen to exclude microorganisms from the product group in this version. The consultation responses were contradictory. It was suggested that the use of microorganisms is currently marginal and primarily used for odour control and that they should therefore not be included in the ecolabelling of cleaning products. Furthermore, the Directorate for Nature Management (the Norwegian environmental authority) expressed doubts over the gaps in our knowledge of the effect of introducing bacteria to nature which were not already present in the ecosystem, with a possible negative effect on the microbial composition. On the other side, there was an interest in this type of products. As we do not currently have the necessary knowledge for laying down well-founded requirements, we shall not be including microorganisms in the criteria on this point. However, we shall be devoting resources to further investigation, in order to answer the unease expressed by the Directorate for Nature Management and to determine whether the criteria can be extended to include microorganisms at a later date.

During 2013-2014 Nordic Ecolabelling started a project evaluating microorganisms in cleaning products. At the meeting on June 11 2014 it was decided by the Nordic Ecolabelling board that an expansion of the product group to include microorganism cleaning products for the professional market can be ecolabelled. See more details under R14.

At the Nordic Ecolabelling Board meeting on June 10, 2015 it was decided to put down the criteria for floor care agents by allowing the product group go out. The product group cleaning products would then be extended to cover wash polish/wash-and-wax care products. The reason for this is the hazardous substances to environment and health in other products. At the Nordic Ecolabelling board meeting on 8 November 2016 it was according to evaluation decided to add outdoor window cleaners, oven cleaners and wash polish/wash-and-wax care products to the product group definition. These were introduced to version 5.4.

The cleaning products listed below are not included in these criteria since the criteria are designed for more general products for frequent cleaning. Special products such as drain cleaner and cleaners for walk-in freezers are excluded.

*Cleaning products intended for special cleaning purposes cannot be ecolabelled in accordance with these criteria. This includes products intended solely for the purpose of:*

- *calcium removal*
- *unblocking blockages, cleaning drains*

- *restricting or preventing biological growth (algae, fungus, bacteria)*
- *total or partial disinfection*
- *continuous cleaning, e.g. fragrance block for cleaning WCs*
- *cleaning products for refrigerated rooms*

*Wipes containing cleaning agents are not eligible for ecolabelling under the criteria for cleaning products or any other current Nordic Ecolabelling criteria. In the event of dispute, Nordic Ecolabelling will determine which criteria a product may be ecolabelled under.*

## **Justification for Nordic Ecolabelling**

To achieve environmental benefits, each individual requirement must have relevance with regard to Nordic Ecolabelling's environmental objectives [Nordic Ecolabelling, 2012]. There must also exist a demonstrated potential to differentiate environmentally more suitable products (there has to be a difference and it must "pay" to set the requirement). It must also be possible to control the environmental aspect in question through the environmental requirement.

These three aspects should be considered together and the approach is called **Relevance-Potential-Controllability (RPC)**. Maximum environmental benefit is achieved by selecting the requirements that have the greatest relevance, potential and controllability with regard to the product's lifecycle.

Nordic Ecolabelling considers there to be many actors within the cleaning product market and that ecolabelling can provide those actors and products that are at the forefront of environmental development a competitive advantage.

The purpose of the criteria is to reduce the potential environmental impact of the product.

The requirements are based greatly on the characteristics of the ingredients, which can be determined with acknowledged methods. The most significant environmental impact can also be regulated by the requirements in the criteria document, i.e. controllability is achieved.

Appendix 1a and 1b contains two MECO analyses, i.e. a summary of effects of the material, energy, chemicals and other (e.g. waste, transport) associated with a cleaning product. MECO can be described as a "light" version of a lifecycle analysis. Energy has been the primary focus in these analyses. It is important to note that there is no numeric factor for the environmental and health impact of the ingredients.

The appendices contain a MECO diagram for concentrated products (Appendix 1A) and one for RTU products (Appendix 1B). This is to highlight that the product categories present slightly different problems.

The assumptions that are made in the MECO diagram are described briefly in Appendix 1c.

The MECO analysis is used to identify which areas pose the greatest environmental and health challenges for cleaning products and are thus most relevant when stipulating requirements. RPC with regard to volume, dosing and performance, ecotoxicity and biodegradability, health and the use phase: energy and water consumption, primary production, packaging and transport are described below.

## **Relevance**

Relevance is assessed on the basis of the environmental problems caused by the product group and their magnitude.

### Volume

Large volumes of cleaning products are sold in the Nordic area, both on the professional and the consumer market. In 2009 in Sweden alone, roughly 100,000 tonnes [KEMI, 2009] of cleaning products were sold. This equates to annual sales of roughly 270,000 tonnes in the Nordic area<sup>2</sup>. Alternative methods of cleaning, such as microfiber cleaning cloths, are used on both the professional and consumer market. Nevertheless, the use of traditional cleaning products is still large. And even with a microfiber cleaning cloth a small amount of detergent is often used.

### Dosage and performance

The overdosing of concentrated products is an issue since users do not follow the recommendations on the packaging instead simply pouring an unmeasured amount into a bucket. This can lead to overdosing. Overdosing leads to the increased resource consumption and the increased emission of chemicals post use into the waste water system. The risk of overdosing RTU products is less since these are pre-diluted on purchase. They can however be overdosed by applying more cleaner than is required. Requirements on performance are linked to the recommended dosage since poor performance further increases the risk of overdosing.

### Ecotoxicity and biodegradability

Consumer cleaning products is used in homes and facilities that are connected to a district sewage system and ones that are not (such as holiday homes, small youth hostels and restaurants).

The use of hand dishwashing detergents is more common than other cleaning products at locations lacking a connection to a municipal waste water system. Nonetheless, cleaning products are also used at such locations. It is therefore important to avoid emissions to the environment of substances that are persistent, highly ecotoxic and/or bioaccumulating.

Ecotoxicity and biodegradability are the most important parameters for the constituent ingredients/chemicals since cleaning products are flushed away with the waste water and enter the waste water system or the environment directly. Products that contain toxic ingredients are more harmful to the environment.

Requirements on biodegradability are important since there are negative environmental aspects besides toxicity. Furthermore, in addition to the negative aspects of which we are aware today, we should count on the discovery of other negative aspects in the future. By placing requirements on biodegradability, Nordic Ecolabelling wishes to minimise the quantity of chemical compounds that accumulate in the environment and that can cause problems for coming generations.

Particular requirements are set of surfactants, which are the largest single ingredient and functionally the most important in the product.

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<sup>2</sup> Calculated based on Swedish data (from KEMI 2009) and with the assumption that "the amount per person" is the same in all countries.

Fragrances and preservatives often contain substances that are classified as environmentally hazardous and/or sensitizing. Accordingly, special requirements are stipulated to limit the use of such.

### Health

Nordic Ecolabelling follows the precautionary principle and both lays down strict requirements for chemicals which are hazardous to health and the environment and encourages technologies for replacing such chemicals. Health is a very important parameter in regard to concentrated cleaning products. The user comes into direct skin contact with the product and is thus subject to risks such as allergies. Products sold in spray bottles produce aerosols that can be inhaled by the user. Some of the substances in the aerosol, such as enzymes and fragrances, can affect the respiratory system. It is therefore important that spray products are only used on small surfaces to minimise the risk of sensitization and other adverse effects.

Fragrances in products for professional use can also constitute a higher allergy risk. The risk is greater in professional use than in consumer use, as the professional user employs the products more frequently and is thus considerably more exposed to them. For this reason, fragrances are prohibited in professional spray products, in which exposure levels are highest. In other professional products, the quantity of fragrances is limited by strict requirements on environmentally harmful substances.

### Use phase: Energy and water consumption

The energy consumed to heat the water for concentrated domestic cleaning products is a significant environmental aspect. This is however not a parameter regarding RTU products since these are used without dilution.

Concentrated professional cleaning products do not necessarily require hot water. Many products are used in cleaning machines [personal contact] that have integrated water heaters. This item in the MECO analysis regarding energy consumption for water heating is therefore most relevant to consumer products and those professional products that require hot water.

In the energy section of the MECO analysis regarding products that are diluted in hot water, water heating is one of the most significant parameters in comparison to transportation, water purification, primary production and packaging.

### Primary production

Significant aspects of primary production are the large consumption of energy and the use of finite resources. Cleaning products contain several ingredients such as surfactants, solvents, fragrances, preservatives, colouring agents and sometimes complexing agents.

The energy required for primary production for ingredients used in concentrated cleaning products is roughly similar to that required for packaging manufacture (consumer products) in the MECO analysis.

Regarding RTU products, the estimated energy consumption for primary production in the MECO analysis is considerably lower than other parameters since RTU products often contain more water than concentrated products.

### Packaging

The quantity of packaging material used for household chemical products is great and the size and quantity of packaging can vary in comparison to the size of the content.

Regarding RTU products, far more material is generally used for 1 litre of in-use solution

than for concentrated products that are diluted on use. This is also shown by the energy consumed in the MECO diagrams in Appendix 1a and b.

Professional products often require less packaging per litre of in-use solution since they are sold in larger package sizes (from 5 litres up to 200 litres). This can also be seen in the MECO analysis in Appendix 1. The energy required for product packaging for one litre of in-use solution of a consumer product is roughly double that of that required by a professional product.

#### Transport and distribution

The MECO analysis demonstrates that transport is a significant parameter for both the ingredients and finished product. The finished product is first transported from the manufacturing plant to stores or other sales points and warehouses. The end user then transports the product to its point of use.

Nordic Ecolabelling lacks data on the impact of the different stages of transport. Products are not always manufactured domestically but transported long distances by road or rail. For the MECO analysis it is assumed that products are transported roughly 5000 km by lorry. The energy consumption for transport is greatest for RTU products and is the most significant energy parameter in the analysis.

### **Potential**

Potential is evaluated based on the environmental benefit within the specific product group and for each area in the MECO analysis as well as for each requirement area in the criteria.

#### Volume

Large quantities of cleaning products are sold on the professional and consumer markets in the Nordic area. The performance and environmental characteristics of the products vary. Accordingly, there is potential to influence this product group.

The quantity of cleaning products that are used could be reduced if all users dosed correctly and only mixed the quantity required for the task.

#### Dosage and performance

Clear instructions as to dosage on the packaging or a dispenser reduce the risk of over-dosing since they make the user aware of how the product should be used. An increase in correct dosing would reduce the emission of chemicals into the environment. There is therefore potential in promoting the correct dosage.

The use of RTU products reduces the risk of incorrect dosing. However, RTU products are unsuitable for large areas and used primarily on small areas. The quantity of active ingredients in one litre of RTU product is however considerably higher than in one litre of in-use solution of a concentrated product that has been correctly dosed. There are pros and cons with both product categories. Nordic Ecolabelling sees that the products are used in different ways and that both variants are suitable for their respective areas of use.

Products that have passed the performance test have demonstrated that they are effective at the recommended dosage. This increases the chance that the user will be satisfied even at the correct, low dosage. The performance of products currently on the market varies. Nordic Ecolabelling ensures that labelled products offer good performance at the

recommended dosage. Requirements on the performance of a product are both relevant and have potential.

#### Ecotoxicity and biodegradability

Products that contain ingredients with low ecotoxicity and that are both aerobically and anaerobically biodegradable impact less on the environment than products with persistent and toxic ingredients. Nordic Ecolabelling is aware that the ecotoxicity and biodegradability of and which ingredients are used in products on the market vary. Nordic Ecolabelling prohibits and/or limits substances that are environmentally hazardous or harmful that can be found in non-labelled cleaning products. There is an opportunity to differentiate between different products found on the market.

#### Health

The potential regarding the health aspects of cleaning products is to reduce the number of new allergy sufferers by limiting the use of sensitizing substances. Today's products differ with regard to their content of allergens and other substances that are detrimental to health. Nordic Ecolabelling therefore sees potential in being able to differentiate between products and only label those with the least impact on health.

Regarding RTU products, Nordic Ecolabelling stipulates additional requirements prohibiting enzymes in sprays and placing more stringent limits on preservatives. RTU products in spray form create aerosol during use that may be inhaled by the user. Nordic Ecolabelling sees that there is potential in limiting the quantities of sensitizing substances.

#### Use phase: Energy and water consumption

Concentrated products require dilution with water which in turn requires heating. Heating 10 litres of water to 40 - 50°C requires 0.5 kWh of energy [Karlstads Elnät], which is also shown by the MECO diagram in the appendices 1a and 1b. Products for professional cleaning machines do not in general require warm water. Water heating is not a significant parameter for RTU either.

There is limited potential in stipulating requirements on a lower water temperature since the majority of concentrated products are intended for hot water.

#### Primary production

Nordic Ecolabelling is convinced that the environmental consequences of fossil and renewable raw materials are considerable. The problem is that the associated potential and controllability is difficult to map and document.

In general, the use of less cleaning product (reduced overdosing) reduces the consumption of primary products. Lower levels of production mean lower less primary production, which both reduces the energy required for extraction and/or processing and also reduced the quantity of packaging for the primary product.

#### Packaging

Reducing the amount of product packaging gives savings during transport and distribution and also reduces the amount plastic required.

There are currently many different types of packaging for cleaning products that or more or less environmentally suitable. Accordingly, there is potential for Nordic Ecolabelling only to approve products packaged to optimise the weight-utility ratio. This potential is greatest on the consumer side since cleaning products are sold in smaller volumes. Professional products are generally sold in larger packaging, i.e. more doses per packaging. Further, professional product are generally more concentrated providing a greater number of doses per unit volume.

RTU products require a considerably higher proportion of packaging per litre of in-use solution than concentrated products. The potential is therefore considerable for RTU products where different packaging contains different amounts of material. One way to reduce the quantity of packaging for RTU products is to encourage the use of refills that are made of less material and lack spray nozzles. Refills for cleaning products have however not proven to be particularly popular products on the market.

#### Transport and distribution

The ingredients used in cleaning products are often transported long distances. Reducing these distances would reduce energy consumption and CO<sub>2</sub> emissions. It is difficult to quantify their impact since transport and distribution occur in many different stages of a cleaning product's lifecycle. In general, the energy consumption (fuel) is related to whether the packaging contains many or few doses. I.e. the more concentrated the product, the less transport per dose. There is potential to reduce the impact of transport by encouraging more concentrated products.

### **Controllability**

Controllability is an evaluation of the ability to set requirements with regard to significant environmental parameters.

#### Volume, dosage and performance

Controllability over consumers' dosage habits and use of cleaning product is very difficult to achieve. Nordic Ecolabelling requires however that clear information is provided to the consumer as to correct dosage.

Professional products are generally more concentrated than consumer products. Some manufacturers and suppliers offer dispenser that reduce the risk of overdosing. It is difficult to control the end user's dosing. However, clear instructions on the product label or data sheet do facilitate.

Products that prove to be effective at low doses do not require overdosing by the user to achieve satisfactory results and thus reduce the risk of overdosing. Nordic Ecolabelling therefore sees requirements on performance and dosage instructions as one way to steer towards more effective products that are also used correctly.

#### Ecotoxicity and biodegradability

The requirement on low ecotoxicity reduces the quantity of substances that are released into the environment. The manufacturer greatly influences which ingredients are added to the product and is aware of the environmental and health aspects of each ingredient. Accordingly, there is great scope to stipulate fully controllable requirements with regard to ecotoxicity and biodegradability, where the manufacturer has the opportunity to decide over the contents of the product.

#### Health

Nordic Ecolabelling criteria stipulate that only low levels of allergens may be included in the product and that fragrances may only be added to consumer products if these themselves contain low levels of allergens. The requirement as regards CMR (carcinogenic, mutagenic and reproductive toxic) classification is included to ensure that such substances are not included in the product.

The manufacturer greatly influences which ingredients are added to the product and is aware of the health aspects of each ingredient. Accordingly, there is great scope to stipulate fully controllable requirements with regard to ecotoxicity and biodegradability.

#### Use phase: Energy and water consumption

It is very difficult to control user habits both regarding dosing and water consumption.

To require the use of less hot water for cleaning is today not controllable since most products (primarily consumer products) are designed for use in warm water. If in the future a product that works at low temperatures is developed, there may be cause to promote such in future criteria.

Nordic Ecolabelling stipulates requirements on user instructions and performance to encourage the more correct use of the products.

#### Primary production

The controllability of primary production is low since the licensee merely purchases the ingredients and has little control of the primary producer.

The availability of renewable ingredients for the product group is limited and insufficient for all manufactures of cleaning products.

Nor should all renewable raw materials be encouraged. For example, the production of non-certified palm oil creates significant environmental impact and social problems.

#### Packaging

The quantity of packaging material in relation to the capacity of the content is limited by the weight-utility requirement. A low weight of packaging material and many doses per package is desired. With this requirement, Nordic Ecolabelling wishes to promote less “unnecessary packaging” per dose.

The use of refills for all RTU products is desirable from the viewpoint of packaging to reduce the amount of packaging material. It is however difficult for the manufacturer (often the licence applicant) to control the quantity of refills that are sold in the shops. Controllability over refills is therefore limited. Nordic Ecolabelling has therefore adapted the requirement on packaging material so that it better reflects market conditions.

The manufacturer is able to influence the packaging used for their products. Accordingly, there is great scope to stipulate fully controllable requirements with regard to packaging but not as to the number of refills that are sold.

#### Transport and distribution

There is limited scope for Nordic Ecolabelling to control the transport and distribution used by primary producers and manufacturers. Many manufacturers do not have control over all of their shipping and the alternative modes of transport can be limited.

## **Versions and validity periods**

Previously the criteria for cleaning products were divided into separate criteria documents for all-purpose cleaners and sanitary cleaning products.

### **All-purpose cleaners - Version 1 – 3 September 1993**

Version 1 impose the requirements relating to harmfulness for health and the environment, the ecotoxicological properties of surfactants and individual requirements applicable to various substances/groups of substances.

### **All-purpose cleaners – Version 2**

The changes from version 1 (3 February 1995 – 27 June 2000) to version 2 (10 December 1998 – 9 June 2003) generally consisted of the introduction of an environmental matrix in which the requirements are interconnected, and an increase in the stringency of the function test.

### **Sanitary cleaning products – Version 1 – 26 August 1994**

Version 1 imposed requirements as to harmfulness on health and the environment, surfactants, complexing agents, disinfectants, preservatives, dyestuffs and fragrance. Requirements were also imposed with regard to the information text on dosage, requirements applicable to packaging and function, as well as individual requirements applicable to certain substances/groups of substances.

### **Sanitary cleaning products – Version 2**

Between version 1 and version 2 (22 April 1999 – 24 February 2004) the changes generally consisted of the introduction of an environmental matrix (in which the requirements applicable to toxicity – degradability, phosphorus, NTA, non-potentially degradable substances, non-anaerobically degradable substances and the weight-utility ratio of the packaging are interconnected) and an increase in the stringency of the function test.

### **Cleaning products – Version 3 – 15 June 2003**

The main changes in criteria version 3 relative to 2 were:

- the combination of the all-purpose cleaner and sanitary cleaning product documents
- a reduction of the maximum limit for substances with relatively high toxicity and low degradability
- the function test was made more flexible
- antibacterial products were excluded
- the product classification requirements were updated
- health-related requirements for fragrance (the proscription of carcinogens and mandatory declaration of allergenic ingredients)

- products that served only as decalcifying agents were no longer encompassed by the ecolabelling criteria

### **Cleaning products – Version 4 – 13 December 2007**

The most significant changes in version 4 compared to version 3:

- Strict limitations on substances classified as environmentally hazardous (R50/53) and the prohibition of CMR substances (substances that are carcinogenic, mutagenic or reproduction toxic).
- Stricter requirements on sensitizing substances.
- Stricter limits for the permitted quantity of substances classified as R51/53 or R52/53.
- Product toxicity and biodegradability (according to the DID list) was replaced by CDV and the limit values tightened.

Version 4 contained a requirement of limited duration regarding fragrances. As of 1 January 2010, this requirement has been included as an alternative. Fragrances that are subject to declaration and/or classified as R42 and/or R43 must not be found at concentrations above 100 ppm (0.010%).

### **Cleaning products – Version 5 – 13 March 2013**

Version 5 of the criteria for cleaning products was adopted on 13 March 2013 and they are valid until 31 March 2017.

12 November 2013 it was decided to clarify that foam products are not to be considered as spray products in section “What products are eligible for a Nordic Swan Ecolabel?” and in R5. The new version is called 5.1.

11 June 2014 it was decided to make it possible to Ecolabel cleaning products for the professional market containing microorganisms. When this has been done there has been changes made to requirements R5 and appendix 3, 4 and 5 and inclusion of a new requirement, R14 about microorganisms. Editorial adjustments of requirements R12 and R19 have been done at the same time. The new version is called 5.2.

30 March 2016 it was decided to prolong the criteria with 9 months. On 17 November 2014 the Board of Directors decided to remove requirement R28 Marketing. The new version is called 5.3 and it is valid until 31 December 2017.

At the Nordic Ecolabelling board meeting on 8 November 2016 it was according to evaluation decided to add outdoor window cleaners, oven cleaners and wash polish/wash-and-wax care products to the product group definition. References to the outdated legislation were also removed. Nordic Swan Ecolabelling’s Criteria Group decided per capsulam on 21 December 2016 to extend the criteria by 9 months. The new version is called 5.4 and is valid until 31 October 2019.

## **The Nordic Market**

Professional and consumer cleaning products from small, medium-sized and large manufacturers can be found on the Nordic market. The products are manufactured both within and outside the Nordic region (primarily in the rest of Europe).

### **The consumer market**

The consumer market offers private label products. These are primarily manufactured in the Nordic region (e.g. Nopa, Danlind and Cleano Production). Some private label products are manufactured in Europe (such as McBride and Dalli de Klok). Brand products from global manufacturers such as Colgate, Reckitt Benckiser, Unilever and SC Johnson are manufactured in Europe for the Nordic market. Lilleborg is the leading manufacturer in Norway and also has production in Norway. In Finland Kiilto is a major manufacturer and their production is in Finland. Several smaller manufacturers also produce products in Finland.

The primary sales channel to consumers is through grocery stores. Grocery store chains thus have considerable influence over which products are available on the market. In Sweden, many consumer products are ecolabelled. This is in part due a strategy practiced by grocery stores to sell primarily ecolabelled household chemicals.

Nordic Swan Ecolabelled grocery stores are found in Sweden (188 stores), Norway (21 stores) and Denmark (2 stores). These all sell Nordic Swan Ecolabelled household chemicals such as cleaning products. Finland does not currently have any Nordic Swan Ecolabelled stores.

### **Professional market**

The professional market has products from many manufacturers that are produced both within and outside the Nordic region. Manufacturers include Diversey, Ecolab, Nilfisk, Cleano Production, Iduna, Sæbefabrikken, Novadan, Kiilto and Lilleborg Profesjonell.

The sales are directly B2B (e.g. to restaurants, hotels and cleaning firms) or via wholesalers such as Staples, Asko and Norengros.

Public procurement tends more and more towards environmentally suitable products increasing the demand for ecolabelled products.

## **Nordic Swan Ecolabel licences**

There are 60 Nordic Swan Ecolabel licenses for cleaning products (October 2011) and nine Nordic EU Ecolabel licenses (October 2011. See Table 2.1. Each licence includes many products. 725 different products (trade names) carried the Nordic Swan Ecolabel (October 2011).

The licences include both consumer and professional products.

**Table 2.1. Number of licences on the Nordic market (October 2011)<sup>3</sup>**

	Licences		Registrations	
	Number of licences	Products/ Trade names	Number of registrations	Products/ Trade names
Sweden	24	158	13	63
Norway	5	20	17	76
Denmark	20	491	15	51
Finland	11	56	18	77

The number of Nordic Swan Ecolabelled products has increased by over 100 products since 2010. With regard to professional products, public procurement's demand for environmental suitable products is one of the drivers behind the increased number of products.

## Regulatory requirement and other label systems

### Detergents Regulation (EC) No 648/2004

The Detergents Regulation is EU legislation and must be observed. The regulation applies to all detergents and cleaning agents. Detergents and cleaning agents are defined in the regulation, as too are surfactants. The regulation applies to pure substances and preparations.

#### *Biodegradability*

The Detergents Regulation sets requirements on the biodegradability of surfactants in detergents and cleaning agents. Unlike previously, the regulation focuses on ultimate biodegradation rather than primary biodegradation.

#### *Labelling*

The regulation sets requirements on which constituent substances must be declared and how these shall be declared. There are requirements on dosage information and an ingredient datasheet as well as their publication.

All detergents and cleaning agents must bear a product name, trade name and/or trademark and contact details of the manufacturer. Information on from where datasheets can be ordered must also be provided. Detergents and cleaning agents must also be labelled with instructions for use and, if necessary, safety instructions. The Detergents Regulation does not annul the requirements on classification, packaging and labelling stipulated by the ClAP Regulation.

## Type I ecolabelling

The Swedish Society for Nature Conservation, SSNC, has ecolabelling criteria, **Good Environmental Choice**, covering cleaning products [SSNC, 2006]. There are roughly 107 cleaning products (within the subcategories all-purpose cleaner, soft soap, toilet cleaner and heavy-duty cleaner) labelled with the Good Environmental Choice label

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<sup>3</sup> Data were collected during the evaluation of the criteria. There have not been significant changes during the revision process.

[SSNC, 2011]. There is also a window cleaning product. Licences are issued for both consumer (48) and professional products (60).

New **EU Ecolabel** criteria were adopted on 28 June 2011 and published 29 June 2011. These criteria include cleaning products for both professional and consumer markets. Products containing microorganisms are prohibited by the criteria. Similarly, concentrated sanitary cleaners are excluded from the criteria. The EU Ecolabel has 2 licences in Sweden (covering 9 trade names), 6 in Denmark (38 trade names) and 1 in Finland (3 trade names).

**Ecologo** is a Canadian Type I ecolabel certified to ISO 14024 ([www.ecologo.org](http://www.ecologo.org)) [Ecologo 2012a]. Ecologo has criteria for many different products, including cleaning products. Ecologo has divided its criteria for cleaning products into roughly 15 different documents, one for each product category such as floor cleaners, biotech-based cleaners, etc. Roughly 2000 products carry the Ecologo label [Ecologo 2012b] and are also sold in the Nordic countries.

## Other private labels

### Avainlippu

Avainlippu (literally the key flag) is a label in Finland. The key flag can be awarded to products (or services) that are made in Finland [Avainlippu, 2011]. It is a registered trademark that is administered by Förbundet för Finländskt Arbete (Federation for Finnish Work). The key flag is not an ecolabel though many consumers believe it to be such due to regional production reducing transport distances. The label is also used on cleaning products.

### Charter for Sustainable Cleaning

In 2005, the International Association for Soaps, Detergents and Maintenance Products (A.I.S.E.) initiated the pan-European “Charter for Sustainable Cleaning” to promote the sustainability of household and industrial/institutional products. The charter applies in all the EU 27 states as well as Norway, Iceland and Switzerland and is open to all companies manufacturing, distributing or placing on the market such products.

To participate in the program, a company must annually report key performance indicators (KPIs) to A.I.S.E. such as chemical safety evaluation, poorly biodegradable organics, energy and water consumption and packaging. There are however no limit values that must be met. A.I.S.E. has summarised the results in a “sustainability report” [A.I.S.E., 2010].

In 2010, A.I.S.E. further developed its Charter for Sustainable Cleaning by introducing "Advanced Sustainability Profiles" (ASPs), which consist of product-specific criteria [AISE, 2010]. The first three product groups appeared in 2010 and covered laundry detergents (powder and liquid), fabric conditioners and dishwasher detergents. In October 2012, criteria for concentrated cleaning products appeared [AISE 2012]. The criteria lay down requirements for product formulation ("environmental safety check"), maximum dosage, quantity of packaging material, recycled packaging and user information. A performance test must be carried out.

According to A.I.S.E., the product requirements are based on LCA analyses of the environmental impact of the different product types. According to A.I.S.E., the "Environ-

mental Safety Check" of the recipe is risk-based and in accordance with REACH principles. The requirements also focus on dosing, packaging and user information.

A.I.S.E. estimates that 40-60% of products on the European market in each product group satisfy the ASP requirements. The system is free of charge to A.I.S.E. members, but in order to use the logo, an A.I.S.E.-approved verification body must certify compliance with the product requirements. A.I.S.E. also warns on its website that the verification may be subject to random checks.

The logo for products satisfying the ASP is similar to that of the Charter for Sustainable Cleaning, but has a green frame.

Read more on:

[http://www.sustainable-cleaning.com/en.companyarea\\_documentation.orb](http://www.sustainable-cleaning.com/en.companyarea_documentation.orb)

### **Association against Asthma and Allergy**

The Association against Asthma and Allergy in each Nordic country has developed its own labelling system. Chemical products are among the products that can be labelled. The label focuses on minimising the risk for allergies as a result of use of the product. The labels are administered differently in each Nordic country by the respective national association. The specific requirements on the products are not public and there is not full transparency regarding financing. This diminishes the credibility of the label.

## **3 About the revision**

### **Purpose of the revision**

Focus areas of the revision:

- Product categories/subgroups
- Product group definition
- CDV
- Environmentally hazardous substances
- RTU products and the impact on health and the environment
- Packaging
- Performance test

The other requirements have been reviewed and some minor changes have been made. For example, the classification requirement has been updated with CLP classifications.

### **About this criteria revision**

This project has been driven as a Nordic project. On initiation, all countries submitted national reports on the criteria, sector and other national data. Throughout the project, manufacturers, trade organisations and other stakeholders in the different Nordic countries have been contacted to assemble knowledge, experience and interests in the area.

**Project participants:**

Nordic Product Manager:	Susanna Vesterlund (Sweden)/ Terhi Uusitalo (Finland) (from September 2012)
Project advisor / National contact person (Norway):	Arne Godal
National contact person (Sweden):	Pehr Hård (from September 2012)
National contact person (Denmark):	Mogens Stibolt (from September 2012)
Product development manager for Nordic Ecolabelling:	Karen Dahl Jensen

## 4 Justification of the requirements

### Environmental requirements

#### 4.1.1 Description of the product

Version 5 clarifies the product categories and these are used throughout the document. The new subcategories are as follows. Further information about each category can be found under Section 2 "Basic facts about the criteria".

- Concentrated, professional
- Ready-to-use WC, professional
- Ready-to-use WC, professional
- Ready-to-use window cleaner, consumer and professional
- Concentrated, consumer
- Ready-to-use, consumer
- Ready-to-use WC, consumer
- Wash polish/wash-and-wax care products

#### R1 Description of the product

The criteria for cleaning products cover several product categories with products intended for different areas of use and in different ways (with or without requiring dilution). Subsequently, Nordic Ecolabelling requires information regarding a product's area of use, dilution and market (professional/consumer). This is done to ensure that the product is covered by the definition of the product group.

The requirements in the criteria are organised by professional and consumer products and the subcategories (such as concentrated products, RTU, WC and window).

Professional products include products that are marketed for use in a professional context, such as institutional kitchens, catering kitchens, restaurants and public services. Products are not considered professional products if they are exclusively sold through retail outlets.

Nordic Ecolabelling is aware that some products are primarily designed for the consumer market but are also sold wholesale to professional users. Ecolabelling's control is then

limited. Accordingly products that are primarily designed for the consumer market are treated as consumer products.

If Nordic Ecolabelling finds uncertainty as to the correct classification of the product, the applicant must submit sales statistics or similar demonstrating on which market the product is sold.

The tightening of this requirement for professional products is in line with the other chemical product groups that can be Nordic Swan Ecolabelled, such as dishwasher detergent for professional use, laundry detergent for professional use and hand dishwashing detergent for professional use.

This categorization has been made since in previous versions many queries were received as to which category should be used for different products under each requirement.

### **The requirement is therefore as follows:**

Detailed information must be supplied on the cleaning products for which a Nordic Swan Ecolabel is sought. The following information must be submitted:

- Description of the product regarding the need of dilution.
- Description of the area of use of the product in accordance with “What products are eligible for a Nordic Swan Ecolabel?”.
- Is the product designed for the professional or the consumer market?\*

*\*A product is considered to be professional if more than 80% of the sales go to the professional market. If Nordic Ecolabelling considers that it is uncertain if a product is a consumer or a professional product the applicant must submit sales statistics or similar that shows where the product is sold.*

- Product label and/or technical data sheet describing the area of use of the product and possible need for dilution (see also R20).
- Documentation specifying the market for which the product is designed (consumer or professional). Marketing material, product information or similar for each country in which the product is sold.

## **R2 Information on formulation/recipe**

Nordic Ecolabelling requires an exact recipe with all constituent substances. This is needed to check each requirement and perform the calculations stipulated by the requirements. The documentation requirement specifies that the safety data sheet must comply with legislation in force. At the time of writing, the REACH directive is applicable, i.e. the safety data sheet must comply with Directive 1907/2006/EC.

The EINECS number was added following consultation, as requested by a Danish industry organisation. As EINECS is a European system (The European Inventory of Existing Commercial Chemical Substances) which lists and defines the chemicals deemed to have been on the market between 1 January 1971 and 18 September 1981, and does not include all chemicals, it is not mandatory in this period.

### **The requirement is therefore as follows:**

Applicants must provide detailed information on the formulation of the hand dishwashing detergent and enclose a safety data sheet for each ingredient. Information on the formulation must include:

- Trade name
- Chemical name
- Proportion (dry and wet sample)
- CAS no. for each ingredient (if an ingredient comprises several substances, this must be stated) and/or EINECS number for each ingredient (if available).
- Function of each ingredient.
- DID number for substances included on the DID list.
- Health and environmental classification.

*The DID number is the number assigned to the ingredient on the DID list, which is used for the evaluation of chemical requirements. The DID-list is available from Nordic Ecolabelling. See page 2 for addresses.*

- Comprehensive recipe for the product as stipulated by the requirement.
- Safety data sheet for each ingredient in accordance with REACH chemical directive (1907/2006) appendix II.

## 4.1.2 Prohibited or limited constituent substances and mixtures

### R3 Classification of the product

By setting environmental and health requirements, Nordic Ecolabelling ensures that products that are toxic or hazardous to health cannot be ecolabelled. The requirements are primarily stipulated for safety reasons since cleaning products are not associated with such classifications.

Classifications such as flammable and explosive are removed from the draft since these are not considered relevant for this product group.

The classification very toxic is included to prevent the introduction of products with this classification. Nordic Ecolabelling does not consider the risk great of products classified as very toxic appearing on the market but nonetheless includes the requirement.

As CLP comes into force for products in June 2015, if/when the substance is classified resp sens 1a, H334 or skin sens 1a, H317, then according to CLP, at concentrations as low as 0.01% (100 ppm), a warning similar to the following must be included on the package: "Contains (name of sensitising substance). May cause an allergic reaction."

In categories 1 and 1b for both resp sens and skin sens, the limit for warnings is 0.1% (1000 ppm). In addition to classification as sensitising, Nordic Ecolabelling prohibits this label on the packaging.

The exemption for professional products containing substances classified as R20 (Harmful by inhalation), R21 (Harmful by contact with skin) and/or R22 (Harmful if swallowed) (H332, H312 and/or H302) is included for products that the manufacturer can demonstrate are packaged in such a way that the user does not come into contact with the product, i.e. the risk for contact with the product has been minimised. At technical description and instructions demonstrating how the user avoids contact with the product shall be provided.

Also excepted are H318 "causes serious eye damage" - R41 "Risk of serious damage to eyes" in all products apart from spray products. This is a change following consultation, and the background is that in the 2nd ATP of CLP, the limit was changed as to when a product is classified as H318. Previously a concentration of 10% of a R41-classified substance was required before the whole product was classified as R41, but with effect from 1 of June 2015, a concentration of 3% of the product classified as H318 is sufficient to classify the whole product as H318. However, the new classification may be applied even now.

According to a study by Nordic Ecolabelling, many surfactants are classified as H318/R41. It will therefore be difficult to manufacture effective concentrated products without a classification as H318. For this reason, the criteria for cleaning products are being changed to match other chemical products, in which H318/R41 is allowed.

However exposure is more likely from spray products which could be accidentally sprayed directly into the eyes, and for this reason the classification is retained for spray products. This is more by way of a signal and a precaution, as spray products generally contain < 1% surfactants and will not be classified as H318/R41 in all cases.

The classification corrosive with R34 (Causes burns) and R35 (Causes severe burns) (H314 with Skin Corr 1A and/or 1B) are permitted for professional products and WC products if the classification is due to a very low or very high pH value. This exemption is included to permit highly concentrated products and products intended for areas of use that require extreme pH values to give satisfactory results. For example, very acidic professional cleaning products are sometimes necessary for sanitary areas. Such very concentrated products are often diluted automatically.

By defining requirements limiting or prohibiting substances with specific intrinsic characteristics, Nordic Ecolabelling can quell concerns regarding the safe use of chemical products and thus promote environmental and/or consumer issues. See also requirement 3. Prohibiting CMR substances is an important health parameter, which is why CMR classified substances are also prohibited at ingredient level (see requirement R3). But to avoid the introduction of products that are classified as CMR due to constituent substances (below the impurity limit of 100 ppm) reacting and forming compounds or products that demand that the detergent is classified as CMR, this requirement also prohibits products that are classified as CMR.

The documentation requirement specifies that the safety data sheet must comply with legislation in force. At the time of writing, the REACH directive is applicable, i.e. the safety data sheet must comply with Directive 1907/2006/EC.

The requirement also applies to refills for spray products in concentrated form, as refills are sold as a concentrates and the classification rules (Dangerous Substances Directive and CLP) thus apply to the concentrated form. Consumers are also exposed to the products in concentrated form when the spray is being diluted from the concentrate.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document the classification table was updated so that references to outdated legislation were removed. In the criteria for floor care products the following were not prohibited: the classification of spray products with STOT SE H335 or Eye Dam. 1 H318 or labelling the products EUH208 (Contains (name of sensitizing substance). May produce an allergic reaction) prohibited. These are not expected to be relevant for floor care products, and therefore no exceptions for them are made in the new version of cleaning criteria. Prohibition on classification of CMR was not on the list of prohibited

classifications in the criteria for floor care products. But because ingredients with CMR classification were prohibited the products cannot be classified as CMR and therefore it is retained on the list for all product types.

**The requirement is therefore as follows:**

Products must not be classified according to the CLP Regulation (EC) No 1272/2008 with amendments as specified in Table 1.

**Table 1. Product classification**

Classification	Hazard category and statement
Hazard class	CLP Regulation 1272/2008
Hazardous to the aquatic environment	Category Acute 1 H400; Category Chronic 1 H410; Category Chronic 2 H411; Category Chronic 3 H412; Category Chronic 4 H413
Acute toxicity	Category 1 – 4; H300, H301, H302 H310, H311, H312 H330, H331, H332 <b>Exception:</b> 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.
Specific target organ toxicity (STOT) with single or repeated exposure	STOT SE, Category 1 with H370, Category 2 with H371 STOT RE, Category 1 with H372, Category 2 with H373 <b>Spray products</b> (consumer and professional): STOT SE with H335, Eye Dam.1 with H318
Aspiration hazard	Category 1 with H304
Respiratory or skin sensitizing	Category 1, 1A or 1B with H334, Category 1, 1A or 1B with H317 or with following warning included on the package: "Contains (name of sensitising substance). May cause an allergic reaction."
Skin Corrosion/ irritation	Skin Corr.1B with H314, Skin Corr.1A with H314. <b>Exceptions:</b> Professional products where classification is due to pH. WC-products for consumers where the classification is due to pH.
Carcinogenic	Carc 1A/1B/2 with H350, H350i or H351
Mutagenic	Mut 1A/B/2 with H340, H341
Reproductive toxic	Repr. 1A/1B/2 with H360, H361, H362

Note that the producer is responsible for classification.

- Safety data sheet for the product in accordance with REACH chemical directive (1907/2006) appendix II.
- Description of the design of the packaging of professional products classified as H332, H312 and/or H302 demonstrating that the user does not come into contact with the product. Technical description and instructions demonstrating how the user avoids contact with the product.

- ☒ Documentation that demonstrates that the product (professional products and consumer WC products) is classified as corrosive due to its pH, permitting exemption for H314 skin corr. 1B and 1A classification.

#### **R4 CMR substances**

By defining requirements limiting or prohibiting substances with specific intrinsic characteristics, Nordic Ecolabelling can quell concerns regarding the safe use of chemical products and thus promote environmental and/or consumer issues and highlight consumer concerns.

The prohibition of CMR substances and the limitation of environmentally hazardous substances are standard Nordic Ecolabelling requirements for chemical products. The prohibition of CMR substances has an important symbolic value but is unlikely to influence the formulation of cleaning products in practice for the majority of manufacturers. From a health perspective CMR substances are undesirable in cleaning products since the user often comes into direct contact with the product.

The prohibition of CMR substances and the limitation of environmentally hazardous substances are part of Nordic Ecolabelling's environmental toxin policy. The prohibition of CMR substances has an important symbolic value but is unlikely to influence the formulation of cleaning products in practice. From a health perspective CMR substances are undesirable in cleaning products since the product group is used by consumers in the home.

The term constituent substance refers to both substances contained in the ingredient and substances that can be liberated such as formaldehyde.

**Lilial** (CAS 80-54-6) has the self-classification Rep3 with R62 and is therefore prohibited by this requirement. Since fragrances are added intentionally and since they fulfil a function, a trivial lower limit is not applicable for fragrances. Lilial cannot therefore be added to a product due to this CMR requirement.

**NTA** is classified as Carc Cat.3 [EU, 2008b]. NTA is therefore prohibited from use due to its classification. Complexing agents that replace NTA (GLDA and MGDA) contain small quantities of NTA impurities from production (as specified on the MSDS for the ingredient). Nordic Ecolabelling's review of licensed products shows that there is a need to use such complexing agents in cleaning products. NTA, present as an impurity in complexing agents, is therefore exempted from the requirement. The concentration of the product must not however exceed 1.0% by weight and the concentration in the final product must not exceed 0.1% by weight.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document the classification table was updated so that references to outdated legislation were removed.

#### **The requirement is therefore as follows:**

The cleaning product must not contain substances that are or may decompose into substances that are carcinogenic (Carc), mutagenic (Mut) or toxic to reproduction (Rep) with the following hazard categories or risk phrase, or combinations of these (see Table 2):

**Table 2 Classification of constituent substances**

Hazard class	Hazard category and statement CLP-Regulation 1272/2008
Carcinogenic	Carc. 1A or 1B; H350 Carc. 1A or 1B; H350i Carc. 2; H351*
Mutagenic	Muta. 1A or 1B; H340 Muta. 2; H341
Reproductive toxic	Repr. 1A or 1B; H360F Repr. 1A or 1B; H360D Repr. 2; H361f Repr. 2; H361d Lact, H362

*\*MGDA and GLDA complexing agents may contain NTA contaminants in concentrations below 1.0%, so long as the concentration of NTA in the cleaning product is lower than 0.1%.*

- Cleaning products: Duly completed and signed declaration of conformity with product requirements (Appendix 3 or equivalent) and ingredient requirements (Appendix 4 or equivalent).
- Wash polish/wash-and-wax: Duly completed and signed declaration of conformity with product requirements (Appendix 8 or equivalent) and ingredient requirements (Appendix 9 or equivalent).
- Safety data sheet for each ingredient in accordance with REACH chemical directive (1907/2006) appendix II (see R2).

## **R5 Sensitising substances (does not apply for for wash polish/wash-and-wax)**

Nordic Ecolabelling wishes to minimise the quantity of sensitizing/allergenic substances in products to minimise the risk of allergies.

When used, cleaning products often come into direct contact with the user, such as with the hands when wringing out a cloth. Another example is exposure to the aerosol from a spray product (such as kitchen and bathroom cleaner). Accordingly it is desirable to minimise the quantity of sensitizing substances with which the user can come into direct contact.

### Preservatives

Since cleaning products contain a large quantity of water, there is sometimes a need to use preservatives, especially if the product's pH value is neutral. Since the CDV limit value has been tightened in this version, reformulation of the cleaning product may be necessary. To enable the use of preservatives, there is an exemption to the requirement on sensitizing substances in preservatives. The exception that sensitising preservatives can only be included in cleaning products with a pH between 3.0-10.0 was omitted after consultation, as it was felt that the new requirement of a challenge test guarantees that no preservative is used where it is not needed, in other words when the product is self-preserved and thus needs no added preservative.

In summer 2012, a Danish research paper was published showing that preservative MIT (DID no. 90, CAS 2682-20-4) may also sensitise the airways and cause contact allergy via air [Lundov 2012]. Today most raw materials manufacturers self-classify the substance as skin sens 1, H317, but there is no harmonised classification. Initiatives are underway to achieve a harmonised classification for MIT. The proposed classifications are Acute toxicity, Skin corrosion/irritation, Respiratory or skin sensitisation, STOT-SE, Aquatic Chronic. What class the sensitising substance MIT will end up in is yet unknown. In line

with the precautionary principle and a general self-classification policy, Nordic Ecolabelling assumes MIT to be classified as sensitising.

100 ppm is the lowest limit, which means that the product pack will be marked with "Contains (name of sensitising substance). May cause an allergic reaction." after CLP comes into force for products in June 2015. However, we do not yet know which substances will be included in the category which requires labelling at levels down to 100 ppm. Following consultation, Nordic Ecolabelling has chosen to lower the limit for all sensitising preservatives to 100 ppm (from 1000 ppm) in line with the precautionary principle. However, Nordic Ecolabelling has chosen to allow sensitising preservatives in small quantities, in order to secure the products' shelf-life. If a product has to be discarded because of short shelf-life, this is unfortunate from an environmental point of view. Products which develop mould or bacterial growths due to low shelf-life are also poor from an allergy point of view. The range of available non-sensitising preservatives is not large and the use of the same preservative in all cases may cause sensitisation to the substances. According to our studies of Nordic Swan Ecolabelled products, the 100 ppm limit should be enough to ensure the shelf-life of the products. All preservatives must also be stated on the packaging and persons who are allergic to any of them can thus choose a product without that substance. The 100 ppm limit is also used for sensitising fragrances, which means that all exempted sensitising substances are handled in the same way.

Spray products produce a different exposure scenario than products that are diluted in water and applied using a cloth. Spray products produce an aerosol that can be inhaled. This increases the risk for the user of exposure to allergens. Nordic Ecolabelling wishes to reduce the quantity of sensitizing substances in sprays and has therefore introduced even more stringent requirements on sprays in this version.

The previous exemption permitting spray products to contain 0.1% of R43 classified preservatives has been removed since Nordic Ecolabelling following the review does not see the need for this.

See also requirement R7 on preservatives.

#### Fragrances

There is a separate requirement regulating the levels of sensitizing substances in fragrances. A total ban on allergens in fragrances would make it almost impossible to produce a fragrance. Nordic Ecolabelling has however in this version of the criteria chosen to prohibit fragrances in professional spray products, as stipulated by requirement R9. The quantity of sensitizing fragrances in spray products has been limited further in this version of the criteria since exposure to spray products differs from that to concentrated products.

#### Enzymes

Enzymes are exempt from the requirement on sensitizing substances since it is difficult to find enzymes that are not classified as sensitizing. Only enzymes in liquid or granulate form are permitted. This is to reduce the risk of dust during the manufacture of the cleaning product. Enzymes are not permitted in spray products since their use entails a greater risk of exposure to aerosol and respiratory problems than concentrated products that are diluted in a bucket. Following consultation it was specified that the exemption also applies to stabilisers and preservatives in enzyme materials. This is because enzymes are proteins and thus easily biodegradable. Protease is also unstable due to autohydro-

lysis. Preservatives and stabilisers are thus necessary for keeping enzymes stable until they are needed for use.

## Microorganisms

It is not clear if microorganisms are to be classified as sensitising or not. The Nordic Ecolabelling has decided to exempt microorganisms in the same way as enzymes from the requirement regarding sensitising substances. Microorganisms are not permitted in spray applications since that creates an aerosol which increases the risk of inhalation related problems.

Microorganisms and enzymes are handled in the same way when setting requirements to the form of microorganisms in the factory, ie only microorganisms added to the products as non-dusting granulates or liquids are permitted to avoid dusting powders. It is unclear to the Nordic Ecolabelling in what form microorganisms are added to the products and the Nordic Ecolabelling considers it therefore to be relevant to set a requirement that does not permit dusting powders.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document this requirement was updated so that references to outdated legislation were removed

### **The requirement is therefore as follows:**

Ingredients must not be classified as sensitising/allergenic with the following hazard statements:

- H334
- H317
- Any combination of these risk phrases/hazard categories.

The following substances are exempt from the above requirements, except in spray products:

- Enzymes (including stabilisers and preservatives in enzyme materials) and microorganisms may be included if in liquid or encapsulated granulate form.
- Fragrance may be included in the end product, see requirement R9 Fragrance.
- < 0.01% by weight preservative classified as resp sens 1, 1a or 1b H334 and/or skin sens 1, 1a or 1b H317 may be included in the end product. See requirement R7 for further preservative requirements.

*MIT (2682-20-4) is deemed to be classified as sensitising.*

For spray products and refills for spray products, the following applies:

- Consumer products: Fragrance may be included in the end product. Professional products: Fragrance may not be included in the end product, see requirement R9 Fragrance.
  - No allergenic preservatives may be included.
- Duly completed and signed declaration that sensitising substances are not included in the product. Use Appendix 3 (manufacturer's declaration) or equivalent. Duly completed and signed declaration that ingredients do not contain sensitising substances. Use Appendix 4 (declaration by supplier of raw materials) or equivalent.
  - Safety data sheet for each ingredient in accordance with REACH chemical directive (1907/2006) appendix II (see R2).
  - Documentation of the concentration of the preservatives classified as sensitising.

- ☒ Safety data sheet or equivalent demonstrating that enzymes/microorganisms are liquid or dust-free granulate form.

## **R6 Substances that must not be present in the final product or being actively added in the raw material**

Nordic Ecolabelling primarily prohibits substances and groups of substances based on their classification. However, since there are undesirable substances that are not prohibited by other requirements, these have been collected in a list of substances/ingredients that may not actively be added to the final product or constituent ingredient.

**APEO and APD:** Alkylphenoethoxylates (APEO) or alkylphenol derivatives (APD) are a group of persistent surfactants that have displayed endocrine disruptive characteristics. These substances have been phased out in the majority of products through legislation. The substances are prohibited by the requirement on surfactants. Declaring APEO and APD along with other substances is considered a small burden for the applicant but simplifies processing the application.

**Reactive chlorine compounds** such as sodium hypochlorite, and organic chlorine compounds such as triclosan, are used as disinfectants/anti-bacterial agents. Such substances can in themselves or can product toxic and persistent or bioaccumulating substances. They can also produce bactericidal and antibiotic resistance in bacteria. Sodium hypochlorite is found on the list of undesirable substances since it is an environmental hazard that can produce organic chlorine compounds. This is particularly important for consumer products where there is a risk of poisonous chlorine gas being produced when mixed with an acid.

**Quaternary ammonium salts that are not readily biodegradable.** The criteria prohibit quaternary ammonium compounds of cationic surfactants with adverse environmental effects such as a lack of biodegradability. There are subsets (such as ester quats) that have better environmental properties that are not prohibited. Quaternary ammonium compounds are often very toxic to aquatic organisms. If such a compound is also non-readily biodegradable it is classified as N with R50/53. Quaternary ammonium compounds are associated with bacterial resistance to antibiotics and with causing certain allergic reactions.

**Benzalkonium chloride** is an ammonium compound. Unlike the aforementioned substances, it is readily biodegradable and is classified as N with R50. Benzalkonium chloride is prohibited due to its toxicity, the risk of causing antibiotic resistance, and since it can produce allergic reactions [Heir et al, 2001], [Wikipedia Benzalkonium Chloride, 2012].

**LAS** has already been prohibited by R13 (requirements for surfactants), as it is not anaerobically biodegradable, but it was added to the list following consultation at the request of a manufacturer who felt that clearer communication with the raw materials manufacturers was necessary. This is thus a precautionary requirement in case a raw materials supplier does not know or fails to remember that LAS is not anaerobically biodegradable. This was done because LAS has been the subject of much focus.

**Ethylenediaminetetraacetic acid (EDTA)** and its salts are not readily biodegradable and, according to the EU's risk evaluation, in conditions found in municipal wastewater treatment EDTA is non-biodegradable or poorly biodegradable [Cefic, 2009]. There are now more environmentally suitable alternatives that are biodegradable and that can replace EDTA. One such is methylglycine diacetic acid (MGDA). The EU is also working actively to limit the use of EDTA in the paper and pulp industry [EU, 2006].

Soap flakes are exempt to the requirement on EDTA since it has proven almost impossible to manufacture soap flakes without a small content of EDTA. The exemption means that Nordic Ecolabelling permits a maximum total content of 0.06% EDTA and phosphonates in soap flakes.

**DTPA** (Diethylenetriamine pentaacetate) has similar properties to EDTA. DTPA can be considered an extended version of EDTA. DTPA has the same chemical structure as EDTA but with one extra ethylene, one extra amine and one extra acetate group [Wikipedia DTPA, 2012]. DTPA has also been classified as harmful to reproduction cat. 2 H361, Repr. cat. 3, R63 and is thus also excluded by requirement R4 CMR substances. This classification has not yet been harmonised under the CLP Regulation and non-classified DTPA is available on the market. For this reason it needs to be clearly excluded.

**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 waste water have dropped over the past 30 years. This is mainly due to improved waste water 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 agents. 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 agents 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 waste water 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.

We therefore wish to prohibit phosphorous from use in Nordic Swan Ecolabelled cleaning products with the exception of solid soap products. Phosphorous was added to the requirement R6 after the consultation. By the time for consultation phosphorous was forbidden with its own separate requirement.

*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.

**Nanomaterials/particles** are natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as 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 nm-100 nm.

This definition is taken from the European Commission's definition of 18 October 2011 [EU Commission, 2011]. According to this definition, a material is classed as a nanomaterial only if 50% or more of the particles are of nanosize except "in specific cases and where warranted by concerns for the environment, health, safety or competitiveness the number size distribution threshold of 50% may be replaced by a threshold between 1 and 50%".

Based on a precautionary principle, Nordic Ecolabelling wishes to set a limit value of 1% since there are no standardized method for the risk appraisal of nanomaterials and since there is great uncertainty as to the long-term effects on health and the environment.

The background to the European Commission's definition is provided by the report "Scientific Basis for the Definition of the Term "Nanomaterial" from the Scientific Committee on Emerging and Newly Identified Health Risks [SCENIHR, 2010]. The report identifies that there are large inadequacies and great uncertainties in the different definitions of nanomaterial. What is the definition of a material with particles larger than 100 nm? Where should the limit be set? If only a proportion of particles are smaller than 100 nm, should the material be defined as a nanomaterial? The report also points out that both external and internal dimensions must be evaluated in order to catch the aggregate and agglomerate particles, but also to keep larger particles with inner nanostructure outside of the definition. The report groups nanomaterial into three groups:

- Natural nanomaterials
- Nanoparticles that are by-products of human activity (e.g. exhaust gasses)
- Engineered nanomaterials

All three categories are nanoparticles and should, according to the report, be included in the general definition.

Materials such as carbon black, TiO<sub>2</sub>, ZnO, SiO<sub>2</sub> and Ag typically comprise of nanoparticles that are agglomerated producing larger particles with dimensions over 100 nm. But with the suggested definition, these materials are also considered nanomaterials since the definition covers nanoparticles in free and fixed states.

Nanoparticles are increasingly used in many types of products to provide new or improved properties. According to an Internet survey, cleaning products are available on the market which claims to make surfaces dirt-repellent as a result of nanoparticles in the product. Nanoparticles can produce unintentional risks to health and the environment. The size of the particles means that they can reach parts of the body and environment are otherwise well protected. Their size increases their reactance since they have a very large surface area compared to larger particles [Teknologirådet, 2008]. Research on the risks of nanomaterials has focused particularly on health effects and in some cases shown harmful effects. For example, nanoparticles can enter a cell and damage its DNA [Folkmann, 2009]. This does not mean that all nanoparticles will cause harm. But there is currently a lack of knowledge regarding the health and environmental effects of nanoparticles, particularly their long term effects [Teknologirådet, 2008]. According to the report from the Scientific Committee on Emerging and Newly Identified Health Risks [SCENIHR, 2009], methods of evaluating the risk of nanomaterials are still under deve-

lopment. To get these in place requires that knowledge on and methods for estimating exposure to nanomaterials and identifying their risks are further developed, validated and standardised.

During consultation it was pointed out that the use of laponite in Nordic Swan Ecolabelled cleaning products is no longer possible under the new nanomaterial definition and requirement. However, Nordic Ecolabelling will not exempt laponite from the requirement, as there is no safety assessment and laponite is not a critical raw material in the product group.

**Perfluorinated and polyfluorinated alkylated substances (PFAS)** are a group of substances with undesirable properties. Fluorinated surfactants and other similar substances with fluorinated carbon chains longer than six decompose to the very stable forms PFOS and PFOA (perfluorooctanoic acid) and similar compounds. Examinations show that these compounds may occur in some types of cleaning products as fluorinated surfactants [KEMI, 2004]. The substances are persistent and are readily absorbed by the body. The substances in this substance group affect the biological processes in the body and are suspected to be endocrine disruptive [OSPAR, 2005], [MST, 2005b]. PFOA and PFOS compounds are a collection of substances that all potentially decompose to perfluorooctane sulphonate, which is persistent and can be found in the blood of humans and animals.

**Methyldibromoglutaronitrile (MG)** is highly allergenic. Studies show that it is so allergenic that a product containing MG can cause allergic reactions even if washed off immediately [Dobel, 2005]. MG is classified as harmful to health, Xn with R20/21/22, and is accordingly not prohibited through other requirements on the classification of constituent substances.

**Nitromusks and polycyclic musks** generally have undesirable effects to both health and the environment. Several such compounds are prohibited through the requirement on CMR substances. Inquiries with fragrance manufacturers have confirmed that many European companies still use polycyclic musks in consumer products. The use of nitromusks is very limited but manufacturers outside Europe still use fragrances such as Musk Ambrette, which is prohibited by IFRA. Prohibiting the use of nitromusks and polycyclic musks is therefore still relevant as a preventative measure.

Nitro musks and polycyclic musks include:

Musk compound	CAS nr
Musk xylene	81-15-2
Musk ambrette	83-66-9
Moskene	116-66-5
Musk tibetene	145-39-1
Musk ketone	81-14-1
HHCB	114109-62-5, 114109-63-6, 1222-05-5, 78448-48-3 and 78448-49-4
AHTN	1506-02-1 and 21145-77-7

**Potential endocrine disrupters** are substances that can influence the hormonal balance in humans and animals. Hormones control a range of vital functions in the body and are especially important to the development and growth of humans, animals and plants. Changes to an organism's hormonal balance can have undesirable effects. In particular focus are hormones that control gender development and reproduction. Several studies

have shown effects on animals that are presumed to result from changes in their hormonal balance. Emissions to the aquatic environment are the primary source of endocrine disrupting substances [State of Environment Norway, 2008]. Nordic Ecolabelling prohibits the use of substances that are potential endocrine disruptors of Category 1 (evidence of endocrine disrupting activity in at least one species using intact animals) or Category 2 (at least some in vitro evidence of biological activity related to endocrine disruption) according to the original EU report on endocrine disruptors [EU, 2000] or subsequent studies [EU, 2002a, 2000b and 2007]. See [http://ec.europa.eu/environment/chemicals/endocrine/pdf/final\\_report\\_2007.pdf](http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf)

#### **PBT (Persistent, bioaccumulable and toxic**

<http://esis.jrc.ec.europa.eu/index.php?PGM=pbt>) and vPvB (very persistent and very bioaccumulable) organic substances are defined in Annex XIII of REACH (Directive 1907/2006/EC) [EU, 2006]. Nordic Ecolabelling considers such substances as generally undesirable.

The majority of PBT/vPvB substances are automatically excluded from use in cleaning products by the restrictions on environmentally harmful substances (see R10). Since some substances, above all vPvB, are not excluded by R10, Nordic Ecolabelling prohibits these directly.

Substances that are "deferred" or "under evaluation" are not considered to have PBT or vPvB properties.

**Substances of very high concern (SVHC)** due to classification as Carc. Cat. 1 or 2, Muta. Cat. 1 or 2, Repr. Cat. 1 or 2, PBT or vPvB substances, or other substances for which scientific evidence suggests probable serious effects to human health or the environment (e.g. endocrine disruptors) are not permitted in cleaning products.

Substances on the candidate list REACH appendix XIV ("Authorisation list"), i.e. substances of very high concern, are not expected to be present in ecolabelled products since ECHA defines such substances as CMR classified. PBT and vPvB substances are already excluded by that requirement. However, substances can also be evaluated case-by-case for inclusion on the candidate list. Nordic Ecolabelling wishes therefore, based on a precautionary principle, to include substances of very high concern in this requirement.

The full list is available at: [http://echa.europa.eu/chem\\_data/candidate\\_list\\_en.asp](http://echa.europa.eu/chem_data/candidate_list_en.asp).

#### **Microorganisms**

Following consultation, Nordic Ecolabelling has chosen to exclude microorganisms from the product group in this version. The consultation responses were contradictory. It was suggested that the use of microorganisms is currently marginal and primarily in connection with odour control and drain cleaning, and that they should therefore not be included in the ecolabelling of cleaning products. Furthermore, the Directorate for Nature Management (the Norwegian environmental authority) expressed doubts over the gaps in our knowledge of the effect of introducing bacteria to nature which were not previously present in the ecosystem, with a possible negative effect on the microbial composition. On the other side, there was an interest in this type of product.

As Nordic Ecolabelling does not currently have the necessary knowledge for laying down well-founded requirements, the criteria will not include microorganisms in this version. However, Nordic Ecolabelling will devote resources to further investigation, in order to answer the unease expressed by the Directorate for Nature Management and to determine whether the criteria can be extended to include microorganisms at a later date.

An updated evaluation of microorganisms was done in 2013-2014 where it was decided to make it possible to label professional cleaning products containing microorganisms, see further information under R14.

The following substances/groups are not explicitly prohibited by this requirement since they are already prohibited by other requirements:

**NTA** is prohibited by requirement R4 since it is classified as carcinogenic.

Special requirements for wash polish/wash-and-wax care products:

#### **Phthalates**

Phthalates must not be present in ingredients/raw materials or the product. Nordic Ecolabelling has reviewed whether it is appropriate to change the existing requirement that ecolabelled floor care products must not contain any phthalates. The study is based on interviews with producers of floor care products and analyses of inherent properties of phthalates as well as risk assessments. Interviews with producers of ecolabelled floor care products [Nilfisk Advance AB and Ecolab AB, 2010] do not provide grounds for amending the requirement, since according to their information phthalates were phased out as long ago as in the 1990s and replaced by tributhoxyethylphosphates. Analysis of the classifications and risk assessments of phthalates shows that phthalates are still a problem with respect to health and the environment, and accordingly it remains appropriate to continue to have requirements in place concerning phthalates, since there is potential for them to be replaced by less problematical substances.

Tributhoxyethylphosphate has no hazard classification and can be used as a softener, as an alternative to phthalates. Tributhoxyphosphate contains phosphate and is accordingly subject to Norway's "Regulations relating to restrictions on the use of chemicals and other products" (the Product Regulation), according to which "producing, importing or selling detergents for use in Norway with a higher percentage by weight of phosphorus than ... c) liquid detergents and washing-up detergents: 0.2% is prohibited" [lovdata.no, 2009].

The requirement regarding phthalates has not been changed during the revision from Version 3 to Version 4.

#### **APEO and derivates thereof**

The product must not contain alkylphenoethoxylates (APEO) or derivates thereof. The background to the prohibition against APEOs is that a number of these substances are suspected of causing endocrine disruption, and the authorities in the Nordic countries have given priority to reducing consumption of these substances.

The requirement has not been changed during the revision from Version 3 to Version 4.

#### **Halogenated and aromatic solvents**

Halogenated and aromatic substances have a considerable impact on health and the environment. There is therefore a requirement that floor care products must not contain such solvents.

#### **Complexing agents EDTA, DTPA, NTA and phosphonates**

Complexing agents constitute a very heterogeneous group of substances having the function of binding compounds (primarily calcium) and keeping them suspended in the washing phase so that they are not deposited in undesirable places, e.g. laundry, washing machine, glass surfaces and so on. An undesired effect of complexing agents is that the

strongest agents are also able to neutralise metal ions and thereby make them mobile in the aquatic environment, where they may cause harm to the environment or to health.

The use of the following complexing agents is restricted in Nordic Swan Ecolabelled floor care products: NTA, EDTA and DTPA and phosphorus-based complexing agents.

EDTA (ethylene diamine tetra acetate and salts thereof), NTA (nitrilotriacetate) and DTPA (diethylenetriamine penta acetate) are suspected of being able to mobilise heavy metals in certain environments due to their complex binding capacity. The problems of this property have, however, been questioned by the industry. [CEFIC, 2003]. EDTA is not readily degradable, and the EU risk assessment states that given the conditions of municipal treatment plants, EDTA will not be degraded at all or be degraded only to a limited extent. [CEFIC, 2002]. NTA has medium to low toxicity for aquatic organisms and is readily degradable aerobically, but no data are available for anaerobic degradability. In the latest amendment of the CLP Regulation, NTA has been classified as Carc3 with R40. DPTA has the same properties as EDTA. NTA is restricted under the requirement on CMR substances, R3.

Phosphonates (DID no. 119) are a number of phosphides that are very good complexing agents. [Lindquist, 2002]. Phosphonates do not harm aquatic organisms, but are persistent and not anaerobically degradable. Phosphonates contain phosphorus and are therefore also a nutrient. On the other hand phosphonates are used in much smaller quantities than phosphorus as they are very strong complexing agents. SCHER estimates that phosphonates used in zeolite based, non-phosphate detergents can constitute a potential risk for the aquatic environment, and their long-term effects should be investigated further. [SCHER, 2007].

Due to the poor degradability of phosphonates, Nordic Ecolabelling has decided that no floor care products of any kind may contain phosphonates.

Complexing agents that may be used include the following: Citrate may function as a complexing agent in certain products. Citrate is not known to be associated with environmental problems and its use as a complexing agent is thus permitted. MGDA (methylglycinediacetic acid), GLDA (glutamate diacetate) and aminoacetic acid may also be used, as these degrade aerobically and anaerobically.

### **Phosphorus**

Phosphorus is a source of eutrophication. Phosphates from agriculture are one of the greatest causes of phosphate in aquatic environments [EEA 2005]. Phosphates from cleaning products and floor care products play a minor role, chiefly because phosphates are effectively removed from waste water. In general, emissions of phosphates from point sources such as waste water have fallen over the past 30 years. This is due primarily to improved treatment of waste water in Northern and Western Europe, following implementation of Council Directive 91/271/EEC concerning urban waste water treatment (EEA 2005).

Regulation (EC) No 648/2004 on detergents was recently introduced, and this regulation mentions phosphates. One proposal [COM (2010) 597] is to introduce a limit for phosphates and other phosphorus compounds in household chemicals such that phosphorus content must be below 0.5%.

Norway has national legislation (source 17) regarding phosphorus in chemical products such as cleaning agents, including wash-and-wax care products and wash polish. The limit means that products can contain no more than 0.2% phosphorus by weight.

Following the consultation, the requirement regarding phosphorus was changed. On the basis of the Norwegian legislation, the total quantity of phosphorus in the final product may be a maximum of 0.20 w/w% in wash-and-wax care products, wash polish, polish removers and wax removers. This is stricter than the phosphorus limit in Version 3, which was 1.0 w/w%. To be clear, the new requirement means that the total quantity of phosphorus may be a maximum of 0.20 w/w% in wash-and-wax care products, wash polish, polish removers and wax removers.

Following the consultation, R11 has been changed from a general requirement regarding complexing agents to a requirement concerning phosphorus. In R17, “the complexing agents EDTA (ethylene diamine tetra acetate), DTPA (diethylenetriamine penta acetate) and phosphonates” have been added to the list of substances that must not be included in the product. NTA is covered by the requirement prohibiting CMR substances.

### **Perfume**

Perfume is not permitted in any type of Nordic Swan Ecolabelled floor care product. Nordic Ecolabelling has introduced a blanket ban on perfume, since perfume can be only slowly degradable, bioaccumulable or allergenic. Floor care products are largely aimed at the professional market, where use of perfume could cause involuntary exposure for cleaning staff, which Nordic Ecolabelling wishes to minimise. Since perfume has no cleaning or care function in floor care products, it is not permitted in such products. Version 3 allowed perfume to be used in wash polish and wash-and-wax care products.

### **Dyestuffs and pigments**

Dyestuffs are added for aesthetic reasons, although it is argued in some quarters that adding colour makes it easier to measure the correct dosage. Very few studies of the effects of health and the environment of dyestuffs exist. Generally dyestuffs in floor care products are regarded as unnecessary additives. Accordingly the requirement is imposed that dyestuffs and pigments must not be added.

The requirement has been amended during the revision from Version 3 to Version 4 to specify that no pigments or dyestuffs may be present in the products.

Volatile organic compounds are undesirable, because they tend to be harmful to health, be poorly degradable in an aquatic environment and have a negative impact on the ozone layer. Floor care products often contain volatile organic compounds, which is why there are requirements limiting the use of such substances.

### **VOC**

Version 3 did not contain criteria concerning VOCs in the form that is found in Version 4. Version 3 had a focus on requirements for substances that have a boiling point of below 150°C, and that are not classifiable as health hazards (Tx, T, C, Xn, Xi, Carc, Mut and Rep). Since ammonia is a component part of some ingredients used in floor care products, has a boiling point of much less than 150°C and is classifiable as a health hazard (C, Xn or Xi depending on the concentration), an exemption previously applied to ammonia. This exemption is no longer relevant in this requirement which applies to volatile organic compounds – not a description that can be applied to ammonia.

In this context, volatile organic compounds are considered to be substances defined under 1999/13/EC as VOCs, i.e. substances that, at 20°C, have a vapour pressure > 0.010 kPa.

In the consultation, the requirement was for the VOC content not to exceed 0.010 w/w%, a figure proposed because Nordic Ecolabelling was unaware of what major

consequences a change in the definition of VOCs would have for the requirement level. The definition of VOCs has been retained, but the requirement was amended on the basis of comments at the consultation and a closer examination of existing licences for floor care products.

On the basis of data for 43 products with a Nordic Swan Ecolabel licence, the following limits have been set for the product's overall content of volatile organic compounds in the finished product:

Wash-and-wax care products and wash polish: VOC <0.5 w/w%.

**The requirement in R6 is therefore as follows:**

- a) The following substances/groups are prohibited from use in the final product and must not be actively added to ingredients:
- alkylphenolethoxylates (APEOs) and/or APEO derivatives (APD)
  - reactive chloro-compounds such as sodium hypochloride
  - chloro-organic compounds
  - quaternary ammonium compounds that are not readily degradable
  - benzalconiumchloride (CAS 8001-54-5)
  - EDTA\* (ethylene diamine tetraacetate) and its salts
  - DTPA (diethylene triamine pentaacetic acid, CAS 67-43-6)
  - LAS (linear alkylbenzene sulfonates)
  - Phosphorous\*/\*\*
  - nanomaterials/nanoparticles\*\*\*
  - perfluorinated substances and polyperfluorinated alkylated substances (PFAS)
  - Methyl dibromo Glutaronitrile (MG CAS 35691-65-7))
  - Nitromusks and polycyclic musks
  - Substances with potential for endocrine disruption of Category 1 or 2 in EU's priority list of substances for further evaluation of their role in endocrine disruption. The report can be read in full at [http://ec.europa.eu/environment/chemicals/endocrine/pdf/final\\_report\\_2007.pdf](http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf) (from Appendix L, page 238)
  - Substances that have been evaluated in the EU to be PBT (Persistent, bioaccumulable and toxic) or vPvB (very persistent and very bioaccumulable) in accordance with Annex XIII of REACH. See e.g. <http://esis.jrc.ec.europa.eu/index.php?PGM=pbt>
  - Substances of very high concern according to REACH article 59: [http://echa.europa.eu/chem\\_data/candidate\\_list\\_en.asp](http://echa.europa.eu/chem_data/candidate_list_en.asp).

\* Solid soap products (e.g. soap flakes) may as a total contain 0.06% EDTA and phosphonates.

\*\* Note the national legislations concerning phosphorous in the Nordic countries. In Norway phosphorus is regulated in «Forskrift om begrensning i bruk av helse- og miljøfarlige kjemikalier og andre produkter (produktforskriften)», §2- 12 and § 2-14.

\*\*\* Nanomaterials/particles: "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 nm-100 nm ." Examples include ZnO,

*TiO<sub>2</sub>, SiO<sub>2</sub>, Ag and laponite with particles in nanosize in concentration over 1%. Polymer emulsions are not considered nanomaterials.*

*Note the definition of constituent substance and impurity in Section 1 of the environmental requirements.*

☒ Duly completed and signed declarations that the above substances cannot be found in the final product (Appendix 3 or equivalent) and are not actively added to ingredients (Appendix 4 or equivalent).

b) The following substances/groups are prohibited from use in the final wash polish/wash-and-wax product and must not be actively added to ingredients:

- Phthalates
- APEO (alkylphenoethoxylates) and derivates thereof
- Halogenated and aromatic solvents
- Complexing agents EDTA (ethylene diamine tetraacetic acid)
- DTPA (diethylene triamine pentaacetate CAS 67-43-6)
- Phosphonates
- Phosphorus > 0,20 w/w%
- Perfume
- Dyestuffs and pigments
- VOC < 0.5 w/w% (defined under 1999/13/EC as VOCs, i.e. substances that, at 20°C, have a vapour pressure > 0.010 kPa.)
- Substances judged to be "Substances of very high concern" (SVHC), and that are on the candidate list  
[http://echa.europa.eu/chem\\_data/candidate\\_list\\_en.asp](http://echa.europa.eu/chem_data/candidate_list_en.asp).
- Nanoparticles (from nanomaterials)

The definition of nanomaterials follows the European Commission's definition of nanomaterials, from 18 October 2011, with the exception of the limit for the number size distribution of particles that are reduced to 1%: Nanomaterial: "a natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for at least 1% of the particles in the number size distribution, one or more external dimensions are in the size range 1-100 nm".

Polymer emulsions are not considered to be nanomaterials.

Duly completed and signed declarations that the above substances cannot be found in the final product (Appendix 8 or equivalent) and are not actively added to ingredients (Appendix 9 or equivalent).

## **R7 Preservatives**

Preservative is added to liquid products to prevent bacterial growth. However, the formulation of the product can also influence the need for preservatives. Certain surfactants in combination with ethanol can have a preservative effect [Miljøprosjekt 1048, 2005].  
Fragrances can also help preserve products as they contain solvents.

In general, preservatives are generally toxic to aquatic organisms and can produce hypersensitivity and allergies. Preservatives can be used in the product and the constituent substances only if they are not bioaccumulating. Bioaccumulating compounds collect in the fatty tissues of living organisms and can cause long-term damage to the environment.

If nothing else is proven, the substance is classified as bioaccumulating if:

- $\log K_{ow} \geq 4.0$  in accordance with OECD guidelines 107, 117 or equivalent. Such a substance can be tested on fish according to OECD test method 305 A-E.
- If the substance's biologic concentration factor (BCF) is greater than 500, the substance is deemed bioaccumulating, and if lower than 500 non-bioaccumulating.

If the substance has a BCF, this determines the substance's bioaccumulation potential.

To avoid the unnecessary use of preservatives and to ensure that the quantity of preservatives is sufficient, a requirement is set regarding the quantity of preservatives in relation to the volume of the product. This is documented using a Challenge test (provocation tests) or other equivalent test and shall be performed during the development of the product. This is a new requirement in this criteria version that aims to avoid unnecessarily high quantities of preservatives in the product.

If small changes are made to the recipe that does not influence the quantity of preservatives, it is not required to repeat this test. If the preservative is changed or if other ingredients are substituted that influence the need for preservatives, the test must be repeated.

Challenge test designates a group of tests used to determine the correct/necessary concentration of preservatives in products. Test samples are prepared with different concentrations of preservatives (for example 2%, 1%, 0.5% and 0.25%) as well as a control without preservatives. A mixture of bacteria, yeasts and moulds are added to the samples. The time for how long a test goes on varies depending on what the main purpose of the test is and under what test conditions the tests are performed such as type of organisms (which depends on how the final product is to be used), pH, temperature /such parameters are not specified in a Challenge test) and so on. The sample with the lowest concentration of preservatives that does not exhibit microbial growth has the correct/optimum concentration of preservatives. Different manufacturers and suppliers of preservatives use different challenge tests/ methods to determine the correct concentration of preservative. Examples include: Koko Test (Test Method SM 021), USP Challenge Test (US Pharmacopoeia) and CTFA Challenge Test (Cosmetics Toiletries and Fragrance Association).

Nordic Ecolabelling does not wish to ecolabel products with anti-bacterial or disinfecting properties. This is also made clear by the section "What products are eligible for a Nordic Swan Ecolabel?". Some of these antibacterial substances, such as Nano silver, are explicitly prohibited by requirement R6. This requirement means that the manufacturer of the product/ingredient declares that the preservative is added to preserve the product but not for antibacterial purposes, thus preventing such products from being ecolabelled.

In 2008, Nordic Ecolabelling carried out a study of preservatives in cleaning products. The results showed that our requirements for preservatives are strict. There are several requirements in addition to the actual preservative requirement which limit the range of permitted preservatives: For example, the CMR prohibition excludes formaldehyde and formaldehyde derivatives, which have been commonly used in recent times. The prohibition of chloro-organic compounds excludes substances such as CMIT, which is also a common preservative. The prohibition of hormone disrupting substances excludes 2-phenylphenol, among others. The requirements for sensitising substances limits the use of preservatives. Depending on the product type, both bactericides and fungicides may be necessary, while MIT, for example, functions as both and phenoxy ethanol only acts

as a bactericide. Requirements which limit preservatives must permit both fungicides and bactericides and allow sufficient choice for manufacturers. If the selection is too limited, this will force manufacturers to use a limited number of preservatives, possibly in higher concentrations. In the long term, a limitation could lead to higher risk of allergy from the substances employed, as the exposure to individual substances will be greater. Another long-term risk is the development of resistance to preservatives if the trend goes towards the increased use of a small number of preservatives.

**The requirement is therefore as follows:**

- a) Preservatives that can be found in the product or in ingredients must not be bioaccumulating. Preservatives are not considered bioaccumulable if  $BCF < 500$  or  $\log K_{ow} < 4.0$ . If both BCF and  $\log K_{ow}$  values are available, the highest recorded BCF value shall be used.
  - b) The concentration of preservatives shall be optimised to the volume of the product. A Challenge test or equivalent test shall be used to demonstrate this.
  - c) Preservatives are only permitted to preserve the product or an ingredient. Preservatives may not be added to produce a disinfecting or anti-bacterial effect.
- Documentation of BCF or  $\log K_{ow}$  (e.g. safety data sheet, see R2).
  - Appendix 3 and appendix 4.
  - Test report of conducted Challenge test or equivalent demonstrating that an optimal concentration of preservatives is used in the product. See Appendix 2 for requirements on test laboratories and information on challenge tests.
  - Duly completed and signed declaration that preservatives are only added to preserve the product or ingredient (Appendix 3 or 4 or equivalent documentation).

**R8 Colouring agents in cleaning products**

Colouring agents are mainly added to the products by aesthetic reasons but some raw materials may also be coloured. Colouring agents can also be added with a function, for example to colour code professional products to keep different product types apart. Red products are often sanitary products and blue products are alkaline and so on. Colouring agents in consumer products can help when dosing the product in toilet cleaners for example, where it is easier to see the amounts of product used if it is coloured instead of clear. Colourants are added in very small amounts and are not considered to be one of the most contributing environmental factors for a cleaning product. Colouring agents are also limited by the CDV requirement, the requirement on environmentally hazardous substances and requirements on non-degradable substances.

In the criteria requirements are set to avoid bioaccumulation colouring agents. Colouring agents permitted in food stuffs are not considered environmentally hazardous and are therefore accepted in the criteria. Colouring agents that are not bioaccumulative do not enter the food chain and thus have limited environmental effects. Bioaccumulation compounds collect in fatty tissues of living organisms and can cause long-term damage to the environment.

If nothing else is proven, the substance is classified as bioaccumulating if  $\log_{Kow} \geq 4.0$  in accordance with OECD guidelines 107, 117 or equivalent. Such a substance can be tested on fish according to OECD test method 305 A-E. If the substance's biologic concentration factor (BCF) is greater than 500, the substance is deemed bioaccumulating, and if

lower than 500 non-bioaccumulating. If the substance has a BCF, this determines the substance's bioaccumulation potential.

The limits for bioaccumulation have been changed when moving to GHS and CLP. The new limits to consider a substance as bioaccumulative are  $BCF \geq 500$  or  $\log_{K_{ow}} \geq 500$ . The limits were 100 and 3 in the previous system. Nordic Ecolabelling has chosen to adjust the limits according to GHS and CLP.

The requirement applies only to cleaning products, in wash polish/wash-and-wax products colouring agents are prohibited, see the requirement R6, substances that may not be included. **The requirements should therefore be designed as follows:**

Colouring agents that can be found in the cleaning product or in ingredients must not be bioaccumulating. A colouring agent is not considered bioaccumulating if  $BCF < 500$  or  $\log K_{ow} < 4.0$ . If both BCF and  $\log K_{ow}$  values are available the highest recorded BCF value shall be used. Colouring agents approved for foodstuffs may be accepted.

- Documentation of the colouring agent's BCF or  $\log K_{ow}$  (e.g. safety data sheet, see R2) or specification of E-number
- Appendix 3 and Appendix 4.

## R9 Fragrances in cleaning products

Fragrances do not enhance the cleaning performance of a product. Also, fragrances contain many substances that have negative health effects, above all sensitising, and also negative environmental impact.

The majority of fragrances contain substances that are classified as H334 and/or H317 and many with H411, H412 or H413. But to totally prohibit fragrances is not considered justifiable in relation to the effect of fragrances at such low concentrations. It is considered likely that a total ban on sensitising fragrances would reduce the market share of Nordic Swan Ecolabelled cleaning products and thus reduce the total environmental benefit of ecolabelled products within this category, since many consumers prefer fragranced products.

Many consumers associate fragrance with cleanliness. Accordingly there is a demand for fragranced consumer products. The market for fragrance-free RTU products is small, particularly for sprays. Nordic Ecolabelling permits small quantities of sensitizing fragrances in such products to enable the addition of a small quantity of fragrance.

Since both stores and manufacturers consider fragrances important to the sales in this product group, fragrances are permitted for cleaning products designed for the consumer market.

With cleaning products it is environmentally important to secure correct dosing, effective products and optimum use of packaging and to ensure that chemicals used in large quantities (such as surfactants) have as little impact on the aquatic environment as possible. If the above requirements are strengthened, the Nordic Swan Ecolabel will guarantee an environmental benefit within the product group. In the case of Ecolabelled products with fragrances, we can influence the large fragrance-buying part of the customer segment to choose a product which is better for the environment. In addition, Nordic Ecolabelling will be treating fragrances in the same way as other chemicals via environmental requirements. Moreover, requirements for environmentally hazardous substances,

non-biodegradable substances and CDV are regarded as limiting the amount of fragrances in products and focussing attention on fragrances with a better environmental profile.

Normally, the users of professional products have not chosen the products they get to use since these are purchased by a purchasing department or similar. A janitor/cleaner is most often unable to choose whether the product is fragrance free or not and may be involuntary exposed to fragrances. A professional cleaner is exposed to more detergent than consumers since they use cleaning products all day long. A similar situation applies regarding public procurement where products are bought for entire boroughs, counties and institutions and the end-user (cleaner) has no influence over product choice.

For the above reasons, Nordic Ecolabelling's consultation proposal was that professional products should be fragrance-free. From the consultation responses it became clear that the market is not yet ready for non-fragranced professional products and that the proportion of non-fragranced products is still small, even though it has increased lately. As cleaning personnel are involuntarily exposed to fragrances in their work, Nordic Ecolabelling has chosen to exclude fragrances from the products which cause the highest exposure, i.e. spray products for the professional market.

The product is considered a professional product if 80% of the sales or more are sold to the professional market, see requirement R1.

It is required to fulfil International Fragrance Association guidelines (IFRA) [IFRA, 2012]. This ensures that the manufacture, handling and use of fragrances in the product fulfil specific standards regarding prohibited substances, limited use and purity. IFRA guidelines support participation to offer products that are safe for consumers and the environment. The guidelines cover the manufacturing and handling of all fragrances for all applications and contain the complete IFRA standards.

The limitation of sensitising fragrances aims to reduce the risk of allergies among users of ecolabelled cleaning products.

The aim of the requirement on allergenic fragrances in Nordic Swan Ecolabelled products is to reduce the risk to allergy sufferers. Nordic Ecolabelling considers it relevant to place more stringent requirements than the legal limits regarding allergenic substances and their declaration.

Requirement b covers the allergens on the 26 list (see the table in Appendix 7). These are subject to declaration in accordance with Regulation (EC) No 648/2004 on detergents and are limited to 100 ppm.

Requirement c covers all other fragrances that are classified as allergens with H317/R43 and/or H334/R42, the content of which is limited to 100 ppm.

In this version of the criteria, Nordic Ecolabelling has chosen to set extra stringent requirements (requirement d) for products sold in spray bottles since these are used differently and are not diluted prior to use. The use of spray products produces aerosol thus increases the risk of inhaling allergenic substances. Concentrated products that are diluted in water do not create aerosols. The threshold value is set to 50 ppm based on licensing data that Nordic Ecolabelling has received regarding consumer spray products. The allergens found in sprays are primarily found in the fragrances. Of these fragrances, those classified as sensitizing (H334 and/or H317 / R43 and/or R43) are generally found in concentrations between 5 to 100 ppm, and most commonly around 50 ppm. This requirement is therefore suitable to minimise the quantity of sensitizing substances to which the user is exposed.

The requirement excludes fragrances in professional spray cleaning products, as cleaning personnel are subject to considerable exposure, often involuntarily, see text above.

Nordic Ecolabelling considers that there is strong justification for this requirement since cleaning products come into direct contact with the user's skin. The hands are subject to prolonged exposure making allergenic substances undesirable.

The requirement contains a clarification that even fragrances from plant extracts are included in the definition.

Please note that nitro musks in fragrances are prohibited by requirement R6.

Note that Lilial (CAS 80-54-6) has the self-classification Rep3 with R62 and is therefore prohibited by this requirement. Since fragrances are added intentionally and since they fulfil a function, a trivial lower limit is not applicable for fragrances. Lilial cannot therefore be added to a product due to CMR requirement R3.

The exemption as to the level of allergens in refills has been added since some refills are concentrated to avoid the unnecessary transport of water. The requirement on these however is that the diluted in-use solution must have a level below 0.050% by weight (50 ppm).

The requirement applies only to cleaning products, in wash polish/wash-and-wax products perfumes are prohibited, see the requirement R6, substances that may not be included.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document this requirement was updated so that references to outdated legislation were removed.

**The requirement is therefore as follows:**

The requirement applies to all fragrances, including fragrances in plant extracts.

- a) The constituent substances that are added to the cleaning product as fragrances must be manufactured and/or handled in accordance with the guidelines of the International Fragrance Association (IFRA). The manufacturer must follow the requirements stipulated by IFRA standards with respect to prohibited use, limited use and material purity.
- b) Fragrances subject to declaration in accordance with Regulation (EC) No 648/2004 on detergents with amendments (see also Appendix 7) may not be present in a cleaning product in concentrations greater than 100 ppm (>0.010%) per substance (n/a to sprayproducts, see requirement d).
- c) Fragrances that are classified as H317/R43 and/or H334/R42 must not be present at concentrations above 100 ppm (>0.010%) per substance in a cleaning product (n/a to spray products, see requirement d).
- d) Sprays: Fragrances subject to declaration in accordance with Regulation (EC) No 648/2004 on detergents with amendments (see also Appendix 7) and/or that are classified as H317/R43 and/or H334/R42 may not be present in concentrations in a cleaning product greater than 50 ppm\* (>0.0050%) per substance.
- e) Fragrances must no longer be included in professional\*\* spray cleaning products or their refills.

*\*Refills for spray products may contain the aforementioned substances in concentrations up to 0.050% by weight (500 ppm) provided that the specified dilution means that the in-use solution has a concentration of 0.0050% by weight (50 ppm) or lower.*

*\*\* Products for professional use here mean products which are marketed for use in professional settings, such as institutions, catering kitchens, restaurants and in the public sector.*

*For products sold to both professionals and consumers, the product is considered a professional product if the proportion sold to professionals is 80 % or higher. In case of doubt whether a product is professional or consumer, Nordic Ecolabelling may require documentation which confirms where the product is to be sold.*

- ☒ Duly completed and signed declaration from the manufacturer of the cleaning product that demonstrates that fragrances are handled and/or manufactured according to IFRA guidelines, as stipulated by requirement R9a. Appendix 3 and 4 can be used.
- ☒ Duly completed and signed declaration from the fragrance manufacturer as to the content of applicable fragrances (e.g. analysis certificate for the 26 allergens and information on substances classified as H334 and/or H317) and any plant extracts. Appendix 4 or equivalent may be used.
- ☒ Calculation of the quantity of the 26 allergens and substances classified as H334 and/or H317) in the end product
- ☒ Recipe according to requirement R2 that demonstrates that no raw materials have been added with the function of fragrance in professional spray products.

### 4.1.3 Ecotoxicity and biodegradability

#### R10 Long-term environmental effects

Substances that are classified as environmentally hazardous are permitted in limited quantities in cleaning products. Persistent substances may cause environmental problems now or in the future. The impact can be particularly serious if the substance is also acutely toxic. Limits on the use of substances with these undesired properties reduce the risk of environmental damage. The environmental characteristics of the constituent substances in cleaning products are particularly important since cleaning products is used extensively in locations lacking a connection to a central sewage system. Accordingly, the maximum content of environmentally hazardous substances with the following risk phrases is limited.

- H410 Hazardous for the aquatic environment. Category: Chronic 1
- H411 Hazardous for the aquatic environment. Category: Chronic 2
- H413 Hazardous for the aquatic environment. Category: Chronic 3

By weighting the parameters, substances classified as H410 are restricted the most. The level is in line with the limit for consumer laundry detergent.

The weighting in the formula below is linked to the classification limits for each classification. There was a need to improve the how these different environmental classifications were totalled through the use of a weighting system to better reflect the actual environmental impact. I.e. it is viable to permit more of a less environmentally hazardous substance than of a more hazardous substance. The weighting in the requirement is the same as the Nordic Ecolabelling criteria for chemical products.

The relationship between the different classifications is shown in the table below [KIFS 2005]:

**Table 4.1. Simplified summary of the relationship between different environmental classifications.**

Classification of substance	Classification of the preparation		
	N; R50/53	N; R51/53	N; R52/53
N; R50/53	Conc. $\geq$ 25%*	2.5% $\leq$ Conc. < 25%*	0.25% $\leq$ Conc. < 2,5%*
N; R51/53		Conc. $\geq$ 25%	2.5% $\leq$ Conc. < 25%
N; R52/53			Conc. $\geq$ 25%

*\*This is somewhat simplified since KIFS 2005:7 [KIFS, 2005] also takes the toxicity of constituent substances into account.*

To make the weighting formula more similar to the classification, the possibility has been discussed to divide the classification H410 / R50/53 into several sub-categories depending on the toxicity classification of the substances. But since such information is seldom available and the quantities are small of these substances, which are already tightly restricted, Nordic Ecolabelling has decided following the review to keep the weighting as above. This may be reviewed in the future if better data is available.

The threshold values for each category are based on licence data received by Nordic Ecolabelling. The majority of substances that are classified as dangerous to the environment are found in fragrances but also in preservatives. Since it is not permitted in this version of the criteria for professional products to contain fragrances, the quantity of environmentally hazardous substances in professional products will be considerably lower than in consumer products. The limits for all categories have been tightened in comparison to the previous version since Nordic Ecolabelling wishes to reduce the levels of these substances and since this is also one way to reduce the quantities of fragrances that are used.

At the 2nd ATP of CLP, the basis of environmental hazard classification was changed (with effect from 1 December 2012). Previously, in order to receive the environmental hazard classification "long-term effects on the environment" (R50/53, R51/53 and R52/53), it was necessary to show that the substance was not readily biodegradable. But in the CLP system, a hazard classification in the category "long-lasting effects on aquatic life" (H410, H411, H412) can be obtained solely on the basis of the chronic toxicity of the substance (if data exists), even if the substance is readily biodegradable. This mostly affects surfactants, which often have low toxicity values but are biodegradable.

According to a study of surfactants and ecolabelled products, this will affect the majority of products. The problem is most acute for surfactants. However, all environmentally hazardous substances are also affected. Affected ingredients include some which have long been employed in ecolabelled products and are both aerobically and anaerobically biodegradable. A large proportion of the surfactants used today are classified as H412, with a few classified as H411, according to a thorough study of surfactants on the market for ecolabelled products and dialogue with the manufacturers. [AISE 2010] [personal contact 2012] It is probable that there are other surfactants similar to those due to be classified as an environmental hazard, which will not be classified because they have not been tested for chronic toxicity. This is also a question of credibility. Manufacturers who have not tested their products must not be privileged over those who have carried out testing.

This means that unless we alter the requirement for cleaning products, we shall lose a large number of licences. This would mean we should no longer be able to influence the

content of these products, and thereby lose the environmental benefits we achieve by ecolabelling cleaning products. For this reason, exemptions have to be made.

However, the general requirements level must not be lowered such that we risk allowing persistent environmentally hazardous ingredients which could not previously be included in ecolabelled products. For this reason, only biodegradable surfactants with classification H412 are to be exempted from the requirement for long-lasting effects on the environment.

At the present time when information is still scarce, Nordic Ecolabelling chooses to exempt aerobically and anaerobically biodegradable surfactants with classification H412 (Harmful long-lasting effects on aquatic life) from the requirement. The exemption was added following consultation, after Nordic Ecolabelling had investigated the matter and its effects. For the next version, Nordic Ecolabelling will be making a careful study of the environmental hazard classification of surfactants and will then have the opportunity to cancel or amend the exemption.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document this requirement was updated so that references to outdated legislation were removed. A limit for wash polish/wash-and-wax care was copied from the criteria for floor care products.

**The requirement is therefore as follows:**

- The use of substances classified with any of the hazard statements H410, H411 or H412 is limited as follows in cleaning products:

Requirement:  $FV < LV$

$FV = 100 * C_{H410} + 10 * C_{H411} + C_{H412}$  in gram / litre in-use solution

Where:

LV = limit value

FV = factor value

$C_{H410}$  = concentration of substances classified as H410 in gram/litre in-use solution

$C_{H411}$  = concentration of substances classified as H411 in gram/litre in-use solution

$C_{H412}$  = concentration of substances classified as H412 in gram/litre in-use solution

Table 3 Limit values (LV) for environmentally hazardous substances for each category

Market	Category	Maximum values (g/l in-use solution)
Consumer	Concentrated products	0,020
Consumer	Ready-To-Use -products - WC	0,50
Consumer	Ready-To-Use -products - other areas	0,30
Consumer and Professional	Ready-To-Use -products - windows	0,30
Professional	Concentrated products	0,0020
Professional	Ready-To-Use -products, WC	0,10
Professional	Ready-To-Use -products, other areas	0,10

- For wash polish/wash-and-wax products applies following: The total quantity of chemical substances that meet the criteria for classification as environmentally hazardous with H400, H410, H411, H412 or H413 present in the product must not exceed 100 mg/g active content. High molecular weight substances (molecular

weight > 700, maximum diameter > 1.17 nm and a maximum molecule length > 4.3 nm) are exempted from the requirement, if they have an aquatic toxicity EC50/LC50 > 100 mg/l.

*If no details of a substance's environmental properties are available it is considered a "worst case" environmental hazard with classification H410.*

Surfactants classified with H412 are exempted from the requirement, provided that they are readily biodegradable\* and anaerobically degradable\*\*.

*\* In accordance to the DID-list. If the substance is not on the DID-list documentation must be according to test method No. 301 A-F or No. 310 in OECD guidelines for testing of chemicals or other equivalent test methods.*

*\*\* In accordance to the DID-list. If the substance is not on the DID-list documentation must be according to ISO 11734, ECETOC No. 28 (June 1988) or other equivalent test methods, where a minimum of 60% degradability under anaerobic conditions is achieved.*

- Declaration of surfactants that are exempted from the requirement (quantity, classification, degradability).
- Summary of the product's content in percentage by weight of substances classified as H410, H411 and H412. Appendix 3 for the product and Appendix 4 for ingredients, or equivalent, can be used to document the content of the specified substances.
- Calculations according to the specified formula demonstrating the fulfilment of the requirement.
- Safety data sheet in accordance with REACH chemical directive (1907/2006) appendix II for each constituent ingredient specifying its environmental hazard (acute aquatic toxicity, biodegradability and/or bioaccumulating characteristics) as for R2.

### **R11 The critical dilution volume (CDV)**

CDV is a theoretical value that takes into regard each substance's toxicity and biodegradability. This method has been developed together with EU Ecolabel. A maximum limit on CDV ensures that Nordic Swan Ecolabelled products have minimal impact on the recipient.

The critical dilution volume (CDV) shall be calculated for all chemicals contained in the cleaning product. This includes all actively added substances and impurities in ingredients if these constitute more than 1% of the ingredient, i.e. shall be included in the CDV calculation.

The CDV limit is only specified with chronic values. Previous versions of the Nordic Ecolabelling criteria allowed applicants to choose between acute and chronic data. In general, the use of chronic data is preferred since the long-term values are considered more accurate and give a more precise/reliable estimate of the potential environmental effects than acute toxicity data. Following consultation it has been specified in the requirement that if  $TF_{\text{chronic}}$  is lacking,  $TF_{\text{acute}}$  may be applied. The safety factors are much higher for acute toxicity values than for chronic.

Since, in parallel with the cleaning revision, a revision of the DID list is underway in which one of the aims is to include more chronic data, Nordic Ecolabelling has in this version of the criteria chosen only to set limits for chronic data.

The new CDV limits are based on licence data that Nordic Ecolabelling has collected. The CDV requirement has been tightened for all categories in comparison to version 4

of the criteria. The product categories are slightly different than in version 4 to make the document simpler and so that the categories are the same under each requirement.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document this requirement was updated with a limit for wash polish/wash-and-wax care that was copied from the criteria for floor care products.

### Microorganisms

Microorganisms are living organisms functioning more like "producers" of enzymes than substances that are degraded when used, i.e. it is not relevant to include them in the CDV calculation. The effect of enzymes is generally very low in cleaning products compared to for example surfactants and perfumes. Microorganisms are not added to the products with a concentration in percentage as other raw materials, but rather with the number of microorganisms, "colony forming units", which makes it difficult to include them in the CDV calculation. Microorganisms are not on the DID-list from 2014.

Microorganisms produce enzymes which stay on the cleaned surface but are considered to be in a very low number. The enzymes produced are mainly lipase, protease, amylase and esterase. According to a producer the enzymes are in such small amounts that they cannot be measured with any commonly used "enzyme measuring tools", neither on the surface nor in the air. The amounts are considered to be so small that it does not seem to be a large risk when excluding them from the CDV calculation.

### **The requirement is therefore as follows:**

The critical dilution volume (CDV) shall be calculated for all chemicals\* contained in the cleaning products. CDV is a theoretical value that takes into regard each substance's toxicity and biodegradability.

*\*Microorganisms are exempted from this requirement*

The product's critical dilution volume is calculated at the recommended dosage that is stated on the packaging.

The product's CDV must not exceed the following limit values for CDV<sub>chronic</sub> :

**Table 5: Threshold values CDV<sub>chronic</sub>.**

Category	CDV <sub>chronic</sub>
Concentrated, consumer	10500
RTU WC, consumer**	600000
RTU other, consumer	700000
RTU window, consumer and professional	75000
Concentrated professional	9500
RTU WC, professional*	700000
RTU, professional	450000
Wash polish/wash-and-wax products	8000***

*\*\*The water in the toilet is not included as a part of the in-use solution.*

*\*\*\* High molecular weight substances (molecular weight > 700, maximum diameter > 1.17 nm and a maximum molecule length > 4.3 nm) are not included in the calculation of CDV.*

CDV is calculated using the formula shown below. CDV must be calculated for all substances in the product:

$$CDV_{\text{chronic}} = \sum CDV_i = \sum (\text{dose}_i \times DF_i \times 1000 / TF_{\text{chronic}})$$

dose<sub>i</sub> = the ingoing quantity of the individual substance i (gram/liter in-use solution)

$DF_i$  = degradation factor for substance  $i$  as shown on the DID-list

$TF_{\text{chronic}}$  = chronic toxicity factor as shown in the DID-list. If  $TF_{\text{chronic}}$  is missing  $TF_{\text{acute}}$  can be used.

- ☒ Calculation of  $CDV_{\text{chronic}}$  for the product.
- ☒ Reference to the DID-list, dated 2007 or later. If the substance is not contained in the DID-list, the parameters must be calculated using the guidelines contained in part B of the DID-list and the associated documentation must be enclosed.

## **R12 Content of aerobic and/or anaerobic non-biodegradable organic material**

A general requirement on aerobic non-biodegradable and anaerobic non-biodegradable substances reduces the levels of non-biodegradable substances to a minimum for cleaning products. The requirement on the biodegradability of organic substances means that ecolabelled products overall offer a good biodegradability profile and reduce the accumulation of persistent substances in sewage sludge and other environments.

Sludge is sometimes used as a fertilizer making it vital that the content of persistent substances is minimised.

Examples of substances often used in cleaning products that are aerobic non-biodegradable (aNBO): fragrances, phosphonates, EDTA, some thickeners, polymers and colouring agents.

Examples of substances often used in cleaning products that are anaerobic non-biodegradable (anNBO): some surfactants (e.g. sulphonated anion surfactants), phosphonates, fragrances and colouring agents.

Organic substances offering poor biodegradability remain in the environment for longer, thus increasing the risk of harm to the environment. Ready biodegradability is therefore desired under aerobic and anaerobic conditions.

A combination of requirements on the quantity of aerobic non-biodegradable organic substances, anaerobic non-biodegradable organic substances and  $CDV$  ensures that the total quantity of non-biodegradable substances and/or toxic substances is limited but nonetheless offering flexibility with regard to the formulation of the product.

The requirement limits for aNBO and anNBO have been tightened compared to version 4 of the criteria. The categories under both requirements are now the same and the requirements have been merged.

The new limits are based on data obtained by Nordic Ecolabelling from products with an ecolabelling licence. Following consultation, the limit for anNBO for professional RTU WC products was lowered to 20 (from 30) owing to a calculation error in the documents used by Nordic Ecolabelling. The reason for the higher limit of RTU WC products compared with other sub-categories is the separate thickening agent.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document this requirement was updated with an exemption to wash polish/wash-and-wax care products because there was no such requirement in the criteria for floor care products.

**The requirement is therefore as follows:**

The product's total content of aerobic (aNBO) non-biodegradable organic materials must not exceed the limits stated below per litre of in-use solution. The product's total content of non-biodegradable organic materials must not exceed the limits stated below per litre of in-use solution.

aNBO and anNBO values are calculated for all organic substances in the detergent.

Note that all surfactants must be aerobically and anaerobically biodegradable according to R13. See also the exemptions from the requirement for anaerobic biodegradability of substances which are not surfactants (Appendix 2, Point 6 Anaerobic biodegradability).

**Table 6. Threshold values for aNBO and anNBO**

	aNBO (g/litre in-use solution)	anNBO (g/liter in-use solution)
Concentrated, consumer	0,100	0,100
RTU WC, consumer*	2,10	6,00
RTU other, consumer	2,00	2,00
RTU window, consumer and professional	2,00	2,00
Concentrated professional	0,045	0,250
RTU WC, professional*	2,25	20,0
RTU, professional	0,70	0,70

Note that the following exceptions apply:

- Cumensulphonate (DID 139) – the data on the DID list does not agree with that published under the HERA project. The following data on cumensulphonates can be used for application: aNBO = R and DF = 0.05. Since BCF = 1.41 and logKow = -2.7, cumensulphonates can in accordance with Appendix 2 be exempted from the calculation of anNBO.
- Iminodisuccinate (DID 148) can be excluded from the calculation of anNBO.
- Wash polish/wash-and-wax products are exempted

- Calculation of aNBO and anNBO for the product.
- Reference to the DID-list, dated 2007 or later. If the substance is not contained in the DID-list, the parameters must be calculated using the guidelines contained in part B of the DID-list and the associated documentation must be enclosed.

**R13 Surfactants**

Surfactants are widely used in cleaning products and constitute a large part of the ingoing chemicals.

Persistent substances accumulate in the environment. These may present a present and future risk if they are acutely toxic. Knowledge regarding the long-term effects of persistent substances is often lacking. Ready biodegradability under aerobic and anaerobic conditions is therefore of great environmental significance. Surfactants are considered central in this context since they represent a group of organic compounds that are found in relatively large quantities. Also, many surfactants are toxic to aquatic organisms. The Detergents Regulation stipulates that surfactants must be aerobically biodegradable. That a product is available on the market does not necessarily mean it complies with legisla-

tion. There are also exemptions from this legislation for professional products. Article 4, item 2 in the Detergents Regulation states the following: *“If a detergent contains surfactants for which the level of ultimate aerobic biodegradation is lower than that stipulated in Annex III, manufacturers of industrial or institutional detergents containing surfactants, and/ or of surfactants for industrial or institutional detergents, may ask for derogation. Requests for derogation shall be made and decided in accordance with Articles 5, 6 and 9.”*

Nordic Ecolabelling considers that there is still relevance in requiring that the surfactants in a cleaning product are biodegradable under both aerobic and anaerobic conditions. Anaerobic non-biodegradable surfactants can accumulate in sewage sludge, which in some countries is used in agriculture. This is undesirable.

All surfactants (irrespective of function) must be readily biodegradable and anaerobically biodegradable. Surfactants that do not have a cleaning effect, such as foam inhibitors, are uncommon in this product group.

**Linear alkylbenzene sulphonates (LAS)** are toxic to aquatic organisms and are not degradable in an anaerobic environment. LAS is a surfactant and prohibited by the requirement on non-anaerobic biodegradable surfactants (R13). For purposes of clarity Nordic Ecolabelling retains LAS on the list of undesirable substances, although LAS already is prohibited since it is anaerobic non-biodegradable.

APEO and APD Alkylphenolethoxylates (**APEO**) or alkylphenol derivatives (**APD**) are a group of persistent surfactants that have displayed endocrine disruptive characteristics. The substances are being phased out from the majority of products through legislation. These are explicitly prohibited by requirement R6.

In the most recent version of the EU Ecolabel criteria for cleaning products, the requirement that all surfactants must be biodegradable under anaerobic conditions has been removed. Instead, there is a limit on the total quantity of surfactant substances that are not biodegradable under anaerobic conditions. Nordic Ecolabelling does not think that the environmental benefits justify removing this requirement on anaerobic biodegradability but has chosen to retain this requirement.

**The requirement is therefore as follows:**

- a) All surfactants must be readily aerobically biodegradable.
- b) All surfactants must be anaerobically biodegradable
- Reference to the DID list dated 2007 or later.
- If the DID list does not contain relevant data, data can be taken from the material safety data sheets provided that the data are reliable and that test methods comply with Appendix 2. Section B of the DID list shows how the various factors are calculated. It is also permitted to refer to analogous arguments as long as these are carried out by a competent third party. It is also permitted to refer to relevant literature that has been scientifically evaluated.

**R14 Microorganisms**

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.

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 agents, 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 *Bacillus 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<sup>4</sup> 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 EcoLogo™<sup>5</sup> has had criteria<sup>6</sup> since 2002 for products containing microorganisms. EcoLogo stipulates requirements on the number of colony forming units<sup>7</sup> (see the Nordic Ecolabelling requirements on CFU below), requires that bacteria are in Risk Group 1<sup>8</sup> 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 exclude pathogen species such as *E. coli*, *streptococcus* (*Enerococcus*), *staphylococcus aureus*, *bacillus cereus* and *salmonella*. This is the same requirement as stipulated 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.

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.

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<sup>4</sup> Group 1: A biological agent that is most unlikely to cause human disease.

<sup>5</sup> [www.ecologo.org](http://www.ecologo.org)

<sup>6</sup> CCD 110, Cleaning and degreasing compounds: biologically based,  
[http://www.ecologo.org/en/seeourcriteria/details.asp?ccd\\_id=455](http://www.ecologo.org/en/seeourcriteria/details.asp?ccd_id=455)

<sup>7</sup> <http://www.moldbacteriaconsulting.com/colony-forming-units-cfu.html>

<sup>8</sup> Council Directive 2000/54/EC, Group 1: A biological agent that is most unlikely to cause human disease.

Läkemedelsverket<sup>9</sup> (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)<sup>10</sup> or Nordic AST<sup>11</sup> (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).

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  $1.0 \times 10^5$  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

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<sup>9</sup> Mail correspondance with Charlotta Edlund, Professor in microbiology, clinical researcher at Läkemedelsverket (2013-10-11)

<sup>10</sup> <http://www.eucast.org/>

<sup>11</sup> <http://www.nordicast.org/page/35>

requirements are also set in the criteria document from Green Seal<sup>12</sup>. 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, ie 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.
- 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

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<sup>12</sup> [www.greenseal.org](http://www.greenseal.org)

in the product registry ([www.pib.no](http://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](http://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 therefore as follows:**

- a) Products containing microorganisms to be eligible for Nordic Swan Ecolabelling are professional cleaning products (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.
  - Microorganisms must not contain any of the following pathogen species when screened using the following or equivalent test methods:
    - E. Coli, test method ISO 16649-3:2005
    - Streptococcus (Enterococcus), test method ISO 21528-1:2004
    - Staphylococcus aureus, test method ISO 6888-1
    - Bacillus cereus, test method ISO 7932:2004 or ISO 21871
    - 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 10<sup>5</sup> 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
  - That the products shall not be used in places where immunocompromised people are present
  - 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](http://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.
- 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, starch, 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.

## Effektivitet

### R15 Performance test – Laboratory test

### R16 Performance test – User test (professional products only)

The performance test is primarily a quality requirement to ensure a satisfactory result of cleaning at the specified dosage of the ecolabelled product. A product that is effective at the dosage recommended on the label reduces the risk of overdosing since the user experiences that the product is effective and does not need to use more than recommended.

This requirement stipulates that the product must equal or better the performance of a reference product. Professional products can be tested using a laboratory test (R14) or user test (R15). Consumer products must be tested by a laboratory. One reason is since Nordic Ecolabelling has not seen any significant demand for the use of the user test in connection with consumer products and since professional users have more experience as they use such products daily. I.e. a test performed by a professional user provides more information than that performed by a consumer.

The test instructions for both the laboratory and user test have been updated in this revision of the criteria. They are now clearer and require that the effectiveness of the product is documented more clearly. This update has been performed with input from the trade.

**The laboratory test** means that the test product (the product that is the subject of the licence application) is tested under laboratory conditions against a reference product. The reference product shall be in the same product category and have the same area of use as the test product. For example, a concentrated floor cleaning product for consumer use shall be tested against a concentrated consumer floor cleaning product and not a kitchen spray. The reference product shall be well established/known on the market. Nordic Ecolabelling does not have a specific list of reference products since there is such a wide range of cleaning products. Such a list would be very long and very difficult to maintain.

The test product must be equally or more effective than the reference product and more effective than water in order to pass the performance test. I.e. the tested cleaning product must clean better than water alone.

The appendices associated with the laboratory test have been updated for clarity. The appendix now also specifies that the product must clean better than water alone.

Requirements regarding the laboratory itself are described in Appendix 2 of the criteria. The laboratory must fulfil the general requirements of standard EN ISO 17025 or be an official GLP approved laboratory.

The applicant's own analysis laboratory/test procedure may be approved for the performance test if:

- The manufacturer has a quality management system encompassing sampling and analysis and has been certified to ISO 9000.

- The test method for performance test is part of the quality system.
- Nordic Ecolabelling shall have access to all raw data from performance testing.

**The user test** means that the product is distributed along with a questionnaire (Appendix 5a-c of the criteria) to a selection of test individuals/companies. The product is tested at least five times at each location. The tester compares the performance of the test product with that of the product they normally use (test product). The reference product shall belong to the same product category and be intended for the same area of use. The tester shall then evaluate effectiveness based on the following parameters:

- Ability to remove soil.
- Gentleness to the surface being cleaned.
- Performance

An additional question concerning microorganism containing products has been added concerning residual cleaning in appendix 5a-c to show that the added microorganism have an effect.

For a positive test result, 80% of the test individuals must respond that the product is equally or more effective than the reference product.

The appendices regarding the user test have been clarified and a new appendix has been added for window and glass cleaning products. It is now clear in the appendices that the product shall be better than water. Some additional adjustments in the appendices were made from responses following the consultation period. The appendices also state that only professional products are eligible for the user test. Professional users have more experienced through their profession of cleaning making such testing more relevant. During the revision, it was proposed to industry stakeholders that professional users could also test consumer products. This was however not seen as suitable.

The test stipulated by the EU Ecolabel for all-purpose cleaner and sanitary cleaner products was updated during 2010/2011 and new criteria were published 28 June 2011. Version 4 of the Nordic Ecolabelling criteria approved the previous version of the EU Ecolabels performance test. This version of the Nordic Ecolabelling criteria approves tests performed according to the EU Ecolabel test instructions of 28 June 2011.

The requirement texts of both tests (laboratory and user test) have been clarified.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document this requirement was updated with test methods for these products.

**The requirements are therefore as follows:**

**R 15 Performance test – Laboratory test**

- a) The product must through laboratory testing demonstrate equal or superior cleaning performance to a reference product within 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 shall be tested against a professional product.

The test shall demonstrate the ability to remove soil in accordance with the method described in Appendix 6.

The test shall be performed by a laboratory complying with Appendix 2 (item 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.

c) For wash polish/wash-and-wax care products applies:

Professional use:

Documentation of laboratory testing (Appendix 6)

Consumer products:

Documentation of laboratory testing (Appendix 6).

Wash polish/wash-and-wax care products for consumers that pass the user test for professional products need not undergo additional effectiveness testing.

Products approved for professional use, and which are to be marketed as consumer products, need not undergo additional effectiveness testing.

*Alternative a:* Test report containing data on dosage, 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 6. 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 Appendix 2 (item 1B).

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

Alternative c: Documentation in accordance with Appendix 6

### **R 16 Performance test – User test (professional products only)**

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 shall be judged in three areas:

- 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 shall be performed by at least five users. All users/testers shall complete Appendix 5 (a, b or c, depending on the product category). The applicant shall collate the results according to Appendix 5d.

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 user test can be used.

c) For wash polish/wash-and-wax care products applies: Documentation of user testing (Appendix 5d).

*Alternative a:* Description of how the test is performed.

*Alternative a:* All fully completed questionnaires (Appendix 5a, b or c) and a summary of responses (Appendix 5d).

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

Alternative c: Description of how the test is performed and documentation in accordance with Appendix 5d

## 4.3 Packaging and user instructions

### R17 Packaging - plastic

PVC is sometimes used in labels and packaging. PVC is sometimes used in labels and packaging. Most bottles used as containers for chemical products consist of polypropylene (PP) or polyethylene (PE), but an internet survey shows that PVC containers are marketed and sold for certain purposes. This could be relevant, at least for cosmetic products (see e.g. <http://www.arcabox.it/en/pvc-pet-plastic-packaging.html#>). A Finnish label manufacturer, Auraprint, which supplies labels for Finnish chemical manufacturers with the Nordic Swan Ecolabel, considers that the materials usually used for labels are PP, PE, PET and paper. [Ääritalo, 2012] Auraprint has stopped using PVC in labels, and according to them, many other suppliers have done the same. However, internet surveys show that PVC is still used to a certain extent for different types of labels outside the Nordic region. This shows that a prohibition against PVC is still relevant, even if the use of PVC packaging is limited.

PVC is prohibited from use in ecolabelled products since it has adverse environmental effects in the waste disposal phase and contains substances with undesirable health effects. When incinerated waste includes PVC, the level of chlorine increases. Chlorine is one condition for the formation of very toxic dioxins in the flue gasses. There are several other sources of chlorine other than PVC. The incineration of PVC does not necessarily increase the quantity of dioxins since chlorine is not the limiting factor for the formation of dioxins at incinerations plants [Hjelmar, 2002], [Erichsen & Hauschild, 2000].

The additional PVC increases the quantity of acidic flue gases and increases the need for purification, thus increasing the waste formed by flue gas purification. The combustion of 1 kg PVC can create up to 1.7 kg salts from flue gas purification [Hjelmar, 2002]. However, the quantity of waste depends on which treatment steps are included in flue gas purification and which steps have a direct effect on the fraction of PVC plastic. The reason why the amount is so large is partly the flue gas purification and partly the ash/slag. As the HCl formed needs to be captured (by means of an acid scrubber), the result is drainage water requiring purification by the addition of limestone. Each tonne of PVC theoretically requires about 900 kg of limestone (say, in practice, 1 tonne) to neutralise the HCl formed during combustion.

PVC waste can also contain heavy metals, which can also cause environmental problems, e.g. cadmium, which enters the flue gases primarily due to its volatility [Hjelmar, 2002]. Compared to current ecolabelling requirements, however, this is of minimal relevance, as the use of cadmium in PVC is no longer permitted [Hjelmar, 2002] and our requirements relate to products manufactured after the prohibition was introduced. Lead compounds are often used as stabilisers in PVC [MST, 2000], and this could also be regarded as a potential problem for health and the environment. Lead has also been prohibited in PVC in Sweden some years ago.

In Denmark, waste contain PVC must be sorted into a separate fraction.

#### **The requirement is therefore as follows:**

Plastic packaging (including caps, lids and pumps) and labels containing PVC or plastic based on other types of chlorinated materials must not be used.

- ☒ Data sheet or declaration specifying the plastics that are used (including labels and caps). Appendix 3 or equivalent declaration may be used.

### **R18 DIN labelling**

Plastic materials shall be labelled according to DIN 6120 part 2, ISO 11469:2000 or equivalent to facilitate sorting in connection with the recycling of plastics at the end of the product's service life. In addition, this labelling can demonstrate that the product does not contain PVC. This sends a message to the customer and provides Nordic Ecolabelling increased control.

#### **The requirement is therefore as follows:**

- To facilitate identification for recycling, plastic bottles that are used as packaging must be marked in accordance with DIN 6120, section 2, ISO 11469:2000 or equivalent standard. Caps, lids and pumps are exempt from this requirement.
- ☒ Documentation of primary packaging demonstrating that marking complies with DIN 6120 or equivalent marking regulations. Images of the product marking or data sheet specifying the marking. Marking may also be specified on the submitted label.

### **R19 Weight-utility ratio (WUR)**

Weight-utility ratio (WUR) is a parameter that aims to reduce the amount of packaging, promote the use of recycled materials and helps to ensure unnecessary transport of packaging and water, i.e. CO<sub>2</sub> emissions. WUR is a measure of the amount of packaging that is used to deliver a quantity of the product with a predetermined benefit. This limitation promotes concentrated products by relating the quantity of packaging to the number of doses.

Nordic Ecolabelling has chosen to not to set requirements related to the primary packaging for two reasons: Controllability over transport packaging is limited and it penalises producers with small production volumes unnecessarily hard.

Further, it is by optimising the primary packaging that the most significant environmental benefits can be gained for products such as cleaning products.

Primary packaging includes the weight of the packaging that contains the cleaning product. This includes the label, bottle top/cap and possible dispenser.

The requirement limit is based on Nordic Ecolabelling's experience of licensing both professional and consumer products.

Nordic Ecolabelling aims for the WUR requirement to disqualify extravagant bottle designs without prohibiting small bottles for concentrated products.

In previous criteria versions, plastic has been given the value  $t=20$  in the WUR calculation. In this version, the figure has been changed in the same way as the EU Ecolabel, i.e.  $t=1$  if there is documented evidence that the packaging is reused. This can be demonstrated with sales figures for refills in comparison to the original packaging.

It is difficult to influence consumers on the Nordic market to buy refills, particularly for spray products. Many grocery stores are unwilling to give shelf space to refills. In the previous version of the criteria, the applicant estimated how many refills were sold per original packaging to demonstrate fulfilment of the WUR requirement. However, since

few stores stock refills for all products, this estimation seldom reflected real life. Nordic Ecolabelling has in this version therefore changed the limit value for RTU products, such as sprays, so that the requirement can be met without requiring refills so long as the packaging is not heavy or bulky. The new limit value for RTU products is now 200 g of packaging per litre of in-use solution.

Manufacturers that can demonstrate that refills are sold can of course include these. Nordic Ecolabelling wishes in that case for documentation/market statistics that support this.

Upon transfer of the wash polish/wash-and-wax care products to this criteria document this requirement was updated with WUR calculation for these products.

**The requirement is therefore as follows:**

WUR is a measure of the amount of packaging that is used to deliver a quantity of the product with a predetermined benefit.

The weight utility ratio (gram packaging/litre solution) of the primary packaging is as follows:

- RTU- clening products:

$$WUR_{RTU} = \sum ((W_i + U_i) / (D_i * t)) \leq \mathbf{200,0 \text{ gram packaging / litre in-use solution}}$$

- Concentrated cleaning products:

$$WUR_{CONCENTRATED} = \sum ((W_i + U_i) / (D_i * t)) \leq \mathbf{1,20 \text{ gram packaging / litre in-use solution}}$$

$W_i$  = Weight of the primary packaging component (i) in grams including cap, dispenser or similar + any refills (sold per original bottle) in grams including cap, dispenser or similar.

$U_i$  = weight (g) of non-recycled (virgin) material in packaging component (i) in gram.

If the proportion of recycled material in the packaging component is 0%,  $N_i = W_i$ .

*Packaging is considered postconsumer recycled if the raw materials are recovered from distribution and/or following use by consumers. If the raw material is industrial waste from the material or packaging manufacturer's own production, the material is not considered postconsumer recycled.*

$D_i$  = Number of doses in the primary packaging component (i), For ready to use products,  $D_i$  = product volume (in litres).

*If a primary packaging component is packed with a refill  $D$  is the sum of the functional doses in both packaging (such as  $W$  is sum of the weight of both packaging (see description of  $W$ )).*

$t_i$  = Reuse factor. I.e. the number of times that the packaging component (i) is reused (by sale of refills).

$t = 1$  if the packaging is not reused for the same function (disposable packaging).

$t > 1$  may only be used if supported by documentation demonstrating that the packaging is reused for the same function.

- Wash polish/wash-and-wax care products

$$WUR = \text{SUM} ((W_i + U_i)/D_i) < X$$

where  $X = 2.5$  g/g active content for consumer products and

$X = 1.0$  g/g active content for professional products

$W_i$  = The weight of the packaging component i (grams)

$U_i$  = The weight of non-recycled material in the packaging component i (grams)

$D_i$  = The product's content of active components (grams)

- ☒ Declaration/documentation from the packaging manufacturer regarding material type of packaging components (e.g. lid, spray nozzle, bottle and label).
- ☒ Calculation of the weight-utility ratio (WUR) and documentation regarding reuse of the packaging, if applicable.
- ☒ Declaration from the packaging manufacture regarding the content of recycled materials (if recycled materials are used).
- ☒ If  $t > 1$ : documentation demonstrating how many times the packaging is reused for the same function (sales statistics or equal documentation).

## **R20 Take-back system**

The Nordic Ecolabelling's Criteria Group decided on the 9 October 2017 to remove this requirement.

## **R21 Information text and use and dosing instruction**

The dosage of cleaning products is an important parameter to prevent overdosing. Overdosing produces significant environmental impact through the unnecessary emission of chemicals.

The requirement means that the product must provide clear usage instructions. Products that are diluted prior to use must clearly state on the label and/or product sheet how they are to be diluted. Following consultation, Nordic Ecolabelling has introduced a requirement for professional products that the datasheet must indicate the recommended dispensing device. This arises from a consultation response from a cleaning enterprise which drew Nordic Ecolabelling's attention to this need.

Products sold in Norway must also fulfil the national requirement on phosphorous and stat "Uten fosfat" (phosphate free) on the label according to requirement R6.

The requirement on packaging designed to prevent contact with professional products that are classified as R20, R21 and/or R22 is now incorporated under requirement R3. Similarly, requirement R1 stipulates that the product category and are of use of the product must be stated.

### **The requirement is therefore as follows:**

- The information text on the packaging must comply with the regulation 648/2004/EC and 907/2006/EC on detergents.
- Clear user instruction as to use of the product.
- Clear instruction regarding area of application
- If the product requires dilution before use, the recommended dose at a normal level of soiling/normal use must be stated clearly on the packaging.
- In the case of consumer products, for example, the dose may be shown as x number of ml equivalent to y capsful per z number litres of water.
- In the case of products intended for use by professional users, the dose may be specified as, for example, x number of ml equivalent to y strokes of the pump or number of lines on the dosing equipment per z litres of water. The information

sheet or technical datasheet must state the recommended dispensing device (e.g. pump, graduated cylinder, pipette or similar)

- ☒ Label, draft of the label or copy of the information (information text and user instructions) on the primary packaging and/or technical product data sheet (if there is one). The information on the label and/or product data sheet shall be provided in the local language.

## 4.4 Quality and regulatory requirements

To ensure that the product fulfils the Nordic Ecolabelling criteria throughout the validity period of the licence, Nordic Ecolabelling stipulates requirements on the quality procedures of the licensee and possible suppliers. To ensure that the Nordic Swan Ecolabel is only awarded to operations that observe pertinent legislation, it is also required that the licensee is not in dispute with the authorities.

### R22 Laws and regulations

This requirement ensures that the holder of an ecolabelling licence is responsible for following safety, working environment and labour legislation as well as the terms and concessions applying at the production facility during production of the ecolabelled product.

These requirements are included to ensure that the requirements of the ecolabelling criteria are upheld during the period of the licence.

#### The requirement is therefore as follows:

The licence holder must ensure that the applicable provisions governing safety, the working environment, environmental legislation and plant-specific conditions/licences are observed at all plants producing the Nordic Swan Ecolabelled products and for all Nordic Swan Ecolabelled products.

*No documentation is required, but Nordic Ecolabelling may revoke the licence if the requirement is not fulfilled.*

### R23 Responsibility for the Nordic Ecolabelling requirements

Applicants must provide a clear description (such as an organisational chart) that shows who is responsible for the observance of Nordic Ecolabelling requirements and who is the contact person with Nordic Ecolabelling. This is to ensure that Nordic Ecolabelling is informed of changes and problems.

**The requirement is therefore as follows:**

- The company shall appoint a contact person responsible for ensuring the fulfilment of Nordic Ecolabelling requirements.
- A chart of the company's organizational structure detailing the responsible contacts.

**R24 Documentation**

The licence applicant must save a copy of the submitted documentation for reference and so that the documentation is available to personnel during the licence period. This documentation must be made available to Nordic Ecolabelling on inspection visits.

**The requirement is therefore as follows:**

- The licensee must be able to present a copy of the application and factual and calculation data supporting the documents submitted on application (including test reports, documents from suppliers and suchlike).
- On-site inspection.

**R25 Quality of the cleaning product**

The quality of cleaning product is important. The licensee must have procedures in place that assure that Nordic Swan Ecolabelled cleaning product maintains the quality it had at the time of application throughout the licence period.

Procedures controlling how claims are registered and handled are important tools in maintaining the quality of the product.

**The requirement is therefore as follows:**

- The licensee must guarantee the quality during production of the Nordic Swan Ecolabelled cleaning product for the validity period of the licence.
- Procedures for collating and, where necessary, dealing with claims and complaints regarding the quality of the Nordic Swan Ecolabelled cleaning product.

**R26 Planned changed and unplanned non-conformities**

A Nordic Swan Ecolabelled cleaning product is ecolabelled provided that the formulation is approved by Nordic Ecolabelling. All changes must therefore be reviewed and evaluated by Nordic Ecolabelling before they are introduced in the product. The licensee must have procedures in place that ensure that Nordic Ecolabelling is informed of planned changes that have a bearing on the requirements.

Unplanned nonconformities that influence the Nordic Swan Ecolabelled product must be reported to Nordic Ecolabelling. Procedures to ensure this must be implemented at the production plant.

**The requirement is therefore as follows:**

- Written notice must be given to Nordic Ecolabelling of planned changes and unforeseen nonconformities that have a bearing on Nordic Ecolabelling requirements.
- Procedures detailing how planned changes are handled.
- Procedures detailing how unplanned non-conformities are handled.

### **R27 Traceability**

Procedures regarding traceability are important when processing claims related to the Nordic Swan Ecolabelled product. It shall be possible to trace from the finished product back to the constituent ingredients. In case of production problems, a traceability system shall ensure that all raw materials in the Nordic Swan Ecolabelled product are the same as at the time of application and included in the correct quantities.

#### **The requirement is therefore as follows:**

- The licensee must have a traceability system for the production of the Nordic Swan Ecolabelled cleaning product.
- Description of/procedures for the fulfilment of the requirement.

## **4 Marketing**

### **R28 Marketing**

The requirement is removed as decided by the Board of Directors 17 November 2014.

## Appendices

Appendices 3 and 4 (Declaration from the manufacturer and supplier of raw material) contain the following additional text:

*This declaration is based on best knowledge at the time of application. With reservations for developments and new scientific findings. If such new knowledge should be made available, the undersigned is required to submit an updated declaration to Nordic Ecolabelling.*

This text has been included so that, for example, chemical manufacturers can sign the appendix based on best knowledge.

Following consultation, the following change was made to Appendix 6: Formula

~~$EFF_p \geq EFF_r + 1,73 \cdot \sqrt{(9 \cdot Sp^2 + 9 \cdot Sr^2) / 10} > 0$~~  was omitted. The formula is very complicated and a 95 % interval is now easily achievable with the calculation programs. Point 7.1b ( $EFF_p \geq EFF_r$ ) can also be used in the following.

## 5 Changes compared to previous versions

The most important changes compared to version 4:

- Changed limit values for CDV (R11) and biodegradability (R12). The sole use of chronic data for CDV calculations.
- New limit value for weight-utility ratio (WUR) for ready-to-use products.
- Prohibition on phosphorous (R6).
- Prohibition on fragrances in professional spray products (R9).
- Changed calculations and changed limits for environmentally hazardous substances (R10).

**Table 6.1. Summary of major changes from version 4 to 5.**

Requirement	Version 4	Version 5
Definition of the product group		Clarification and grouping in sub categories, the same category scheme applies throughout the criteria document. The criteria document has 2014 been expanded to also cover professional products with microorganisms.
Classification (product and constituent substances)	Dangerous Substances Directive 67/548/EEC	Dangerous Substances Directive 67/548/EEC and CLP Regulation 1272/2008
Allergenic substances		Requirements for sprays tightened: Spray products: Consumer products can contain fragrances in the final product, professional products must not contain any fragrances, see requirement R9 on fragrances. The product must not contain any sensitising preservatives or enzymes.
Prohibited substances	Silver nano particles No requirement for micro organisms	Links updated and addition of: Substances of very high concern Nitromusks (previously a separate requirement) vPvB and PBT substances Phosphorus All nano particles (see definition)
Preservatives		Additional requirement regarding challenge test or similar to ensure optimised concentrations. Change of limit for BCF and logKow in line with new legislation
Colouring agents		Change of limit for BCF and logKow in line with new legislation
Fragrances in professional products	Permitted	Prohibited in spray products
CDV	Option between acute and chronic values	Only chronic values. New grouping of categories and new threshold values.
aNBO, anNBO		New grouping of categories, new threshold values and changes to exemptions from the requirement for anaerobic biodegradability of substances which are not surfactants (Appendix 2, Point 6 Anaerobic biodegradability).
Environmentally hazardous substances	Requirement on R50/53 in g/l in-use solution, and R51/53 and R52 in g/l in-use solution	Weighted formula: $FV = 100 * A \text{ H410} / R50/53 + 10 * A \text{ H411} / R51/53 + A \text{ H412} / R52/53$ in g/l in-use solution Exception for biodegradable surfactants with H412.
Microorganisms		A new requirement added in 2014, which makes it possible to Ecolabel microorganism based products as long as they fulfil this new requirement.

Performance test: Lab test and user test	Performance test: Lab test and user test	Clarification of the tests. User test permitted for professional products only.
WUR (Return number)	Return number t=20 for plastic packaging	t = 1 if the packaging is not reused for the same function (disposable packaging). t > 1 may only be used if supported by documentation demonstrating that the packaging is reused for the same function.
WUR (recycled plastic)	-	Packaging is considered post-consumer recycled if the raw materials are recovered from distribution and/or following use by consumers. If the raw material is industrial waste from the material or packaging manufacturer's own production, the material is not considered postconsumer recycled.

## 6 New criteria

In future criteria, the following areas will be assessed, among others:

- Possibility of dividing H410/R50/53 substances into sub-categories according to ecotoxicity values.
- Investigating the effects of changed environmental hazard classification of surfactants and opportunities for cancelling or amending the exception in R10.
- Relevance of adding other soil types (such as protein and starch) to the performance test
- Relevance of limiting CMR, PBT and SVHC substances in packaging also.
- Relevance of the requirement for manufacturers to offer a pump or other dispensing device for professional products
- Possibility and relevance of imposing requirements for compliance with industry agreements on logistics, optimisation, distribution and transport.
- Possibility of imposing more specific requirements for packaging return systems.
- Possibility of imposing relevant requirements for lowering the quantity of colourants in products.
- Possibility of expanding the product group with products currently falling outside the product group limits, e.g. oven cleaners and products containing microorganisms.

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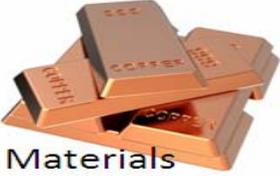
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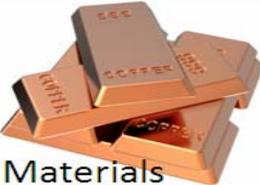
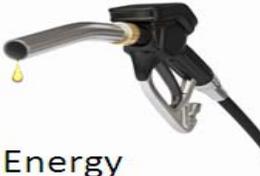
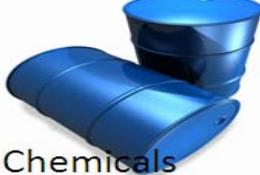
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## Appendix 1a-MECO/MEKA for concentrated cleaning products

<p><b>MECO/MEKA:</b></p> <p><b>Cleaning agents products for consumer and professional use.</b></p> <p><b>Functional unit:</b> 1 wash = 10 liter of water</p>										
 <p><b>Materials</b></p>	<p>Extraction and refining and synthesis from petrochemical raw materials (oil/gas)</p> <p>Growing, harvesting and refining of biobased raw materials (palm kernel oil, forestry (cardboard), etc)</p> <p>Use of land area and petrochemical reserves.</p>	<p>Production and manufacturing of plastics and plastic components.</p> <p>Additives, softeners and other chemical treatment. Surface treatment included.</p> <p>Production of machinery and other equipments.</p>	<p>Diesel oil for distribution</p>	<p>Water consumption ~ 10 l/wash</p> <p>It is ~ 17 wash per kg cleaning agents</p> <p>Use consumer: 6 g/liter water = 60 g/wash Use professional: 2,5 g/liter water = 25 g/wash</p> <p>Raw materials for electricity production</p>						
 <p><b>Energy</b></p>	<p>Use of energy for extraction/growing, refining and manufacturing of raw materials &amp; packaging.</p> <p>Inherent energy in feedstock and packaging materials.</p> <p>Total energy for raw materials: ~ 0,4 MJ/wash consumer ~ professional</p>	<p>Production and manufacturing of final products including packaging.</p> <p>Packaging per wash: Materials include PE and PP ~ 0,33 MJ/wash consumer ~ 0,14 MJ/wash professional</p>	<p>Energy for distribution of products (and raw materials etc.) Assumed 5,000 km in a truck.</p> <p>~ 1,6 MJ primary energy/wash cons ~ 0,7 MJ primary energy/wash prof</p> <p>Energy consumption at retailer &lt; 0,01 MJ/wash</p>	<p>Electricity for heating of 10 l water: 0,5 kWh/wash ~ 4,5 MJ primary energy/wash</p> <p>Energy for water supply: ~ 0,04 MJ</p>	<p>Energy for wastewater treatment (10 l) ~ 0,1 MJ. 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</p>					
 <p><b>Chemicals</b></p>	<p>Potential emissions from extraction and manufacturing of raw materials.</p>	<p>Handling of chemicals in production – risk of exposure in the working environment</p> <p>Potential emissions from production (cleaning of tanks and risk of unintended spills). Probably of minor importance in a life cycle perspective for the total consumption of cleaning agents.</p>		<p>Risk of exposure to chemical substances in handling of products and substances left on cleaned plates etc. E.g. sensitizing substances.</p>	<p>Emissions 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.</p>					
 <p><b>Other</b></p>	<p>Labour and workplace conditions at plantation?</p> <p>Impacts on nature from changes in land area – risk of net emissions of carbon from deforestation.</p>		<p>Particulate matter and other emissions from distribution vehicles.</p>							

Appendix 1b – MECO diagram for RTU cleaning products

<p><b>MECO (MEKA):</b>                      RTU (Ready To Use)                      Cleaning Agents.                      Functional unit:                      1 liter RTU</p>						
 <b>Materials</b>	<p>Extraction and refining and synthesis from petrochemical raw materials (oil/gas)</p> <p>Growing, harvesting and refining of biobased raw materials (palm kernel oil, forestry (cardboard), etc)</p> <p>Use of land area and petrochemical reserves.</p>	<p>Production and manufacturing of plastics and plastic components.</p> <p>Additives, softeners and other chemical treatment. Surface treatment included.</p> <p>Production of machinery and other equipments.</p>	<p>Diesel oil for distribution</p>	<p>Bottles and refills:                      All calculations assume 1 liter of product.</p>		
 <b>Energy</b>	<p>Use of energy for extraction/growing, refining and manufacturing of raw materials &amp; packaging.</p> <p>Inherent energy in feedstock and packaging materials.</p> <p>Total energy for raw materials: ~ 8,1 KJ/liter RTU</p>	<p>Production and manufacturing of final products including packaging.</p> <p>Packaging per wash:                      Materials include PET+PP or PE-HD+PP                      ~ 12,8 MJ/1 RTU Bottle                      ~ 6,0 MJ/1 RTU Refill</p>	<p>Energy for distribution of products (and raw materials etc.) Assumed 5,000 km in a truck.</p> <p>~ 28,0 MJ primary energy/1RTU Bottle                      ~ 26,4 MJ primary energy/1RTU Refill</p>	<p>Electricity for heating:                      Not relevant</p>	<p>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</p>	
 <b>Chemicals</b>	<p>Potential emissions from extraction and manufacturing of raw materials.</p>	<p>Handling of chemicals in production – risk of exposure in the working environment.</p> <p>Potential emissions from production (cleaning of tanks and risk of unintended spills). Probably of minor importance in a life cycle perspective for the total consumption of cleaning agents.</p>		<p>Risk of exposure to chemical substances in handling of products. E.g. sensitizing substances. Risk of allergy and asthma.</p>	<p>Emissions 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.</p>	
 <b>Other</b>	<p>Labour and workplace conditions at plantation?</p> <p>Impacts on nature from changes in land area – risk of net emissions of carbon from deforestation.</p>		<p>Particulate matter and other emissions from distribution vehicles.</p>			

## **Appendix 1C – Assumption and simplifications in the above MECO diagram**

### **The following applies to both MECO diagrams:**

Data on raw materials is taken from Ecoinvent<sup>13</sup>, 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.

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<sup>13</sup> Database linked to LCA tool.