About Nordic Swan Ecolabelled Dishwasher detergents for professional use Version 2.13

Background to ecolabelling

Nordic Ecolabelling

Nordic Swan Ecolabelled dishwasher detergents for professional use - Background to ecolabelling

080/Version 2.13, 10 January 2023

Appendices

Summary

This background document contains a brief description of the product group and its impact on the environment, a market overview and a background to the requirements stipulated in the criteria document.

The criteria document for dishwasher detergents for professional use covers dishwashing using dishwasher detergent in dishwashers in institutions and catering centres. Dishwashing in special machines used in food production, dairies, and such is not covered due to different types of dishwashers and different hygiene requirements. The criteria comprise requirements on dishwasher detergents, rinse aids, presoaks and customer visits.

Dishwasher detergents, presoaks and rinse aids impact the environment throughout their entire lifecycle. Emissions to air and discharges into water and the ground occur during the refinement of ingredients, the manufacture of the product itself and, finally, during the use of the product and ends up in a sewage treatment plant. The requirements focus on the environmental impact of dishwasher detergents and rinse aids during use, which is chiefly the phase that ecolabelling can influence. The dishwashing process covers the use of water, energy, dishwasher detergent and rinse aid. The dishwashing process also includes presoaking performed before the dishes are put in the dishwasher.

The used washing solution normally exits via the sewage system and treatment works before being released. It is desirable for washing water and sludge from the treatment works to have a minimal content of environmentally harmful substances. Toxic, bioaccumulating and persistent substances must therefore be avoided.

The criteria document set requirements on all the constituent substances. Dishwasher detergents can contain various chemical substances, such as alkalis, complexing agents, bleaches, surfactants, dispersing agents and anti-corrosion agents. See Appendix 1 for more information about the different types of chemical.

Dosage of single component dishwasher detergent is determined by the water hardness and soiling of the dishes. This often leads to an excess of either alkalis or complexing agents, which constitutes an unnecessary environmental burden. The use of a multi-component dishwasher detergent, with alkalis in one container and complexing agents in another, enables dosing to be optimised to both water hardness and dish soiling.

Accordingly, multi-component systems are also covered by the criteria. For such systems, each component must fulfil the Nordic Ecolabelling requirements on constituent substances. Also, the chemical content of the complete system must fulfil the requirements on the total quantity of chemicals and the limit values for all parameters in the calculations.

To guarantee the product's effectiveness it is necessary for the dishwasher detergent to give satisfactory results in a user test. A multi-component system shall include the components that are necessary to fulfil the performance requirements.

Requirements are also set on packaging, dosing, take-back system, information and environmental and quality control. In addition, requirements are stipulated regarding visit

reports that document calls on customers that take place in agreement between the manufacturer/supplier and the customer.

The correct use of a dishwasher and correct dosage reduce the consumption of energy and chemicals, and thus also environmental impact. Customer visits and visit reports are instruments that provide the customer and supplier sound data to demonstrate the maximum benefit and efficiency of the supplied product. Customer visits to the majority of their customers are today a standard procedure for manufacturers/suppliers. In exceptional cases, depending on the distance and method of delivery, customer visits may be impractical and difficult.

The requirements are stipulated to reduce the obvious environmental impact of dishwasher detergent, such as the emission of chemicals that are toxic, bioaccumulating and/or persistent.

Persistent substances may cause environmental problems now or in the future. The effects are particularly serious if the substances are also toxic. Limits on the use of substances with these harmful properties reduce the risks of environmental damage.

Dishwasher detergent can also cause health problems, such as sensitisation. Accordingly, some of the requirements regard chemicals that are harmful to health.

The limits have been made stricter on parameters such as aNBO and anNBO. The limit for phosphorous has been made more strict than many of the other requirements and there has also been an addition of a requirement for total amount phosphorous in the product. We have chosen to set the limit for phosphorous on the same limit as the Norwegian legislation, which is the most stringent in the Nordic countries.

The most important changes since version 1.4:

- Prohibition of EDTA
- Introduction of CDV
- Tightening of limits for biodegradability (aNBO and anNBO)
- Changed calculations and changed limits for environmentally hazardous substances
- Tightened limit for the total content of phosphorous
- Expansion of the product group to include manually dosed professional products and products to be used in hybride/semi-professional machines
- Changes regarding customer visits and visit reports
- Inclusion of requirements on user instructions/environmental advice
- Addition of CLP classification
- New layout

General facts about the criteria

Products that can be labelled

These criteria apply to dishwasher detergents, rinse aids and presoaks for professional use within institutions and catering centres. The criteria includes customer visits.

Dishwasher detergents for special machines used in food processing, dairies, etc., are not included. The criteria also apply to customer visits.

According to users and suppliers that were asked, the majority considered presoak to loosen stubborn soiling quicker and better than water alone. Presoak has the potential to reduce the amount of dishes that require rewashing and thus lower energy consumption. It has therefore been included in the product group.

The criteria has been expanded to include manually dosed professional products and products with a dishwashing cycle under 20 minutes. This has been done to include products for hybride/semi-professional machines.

Justification for Nordic Ecolabelling

The chemical requirements can in general be considered to have continued relevance, potential and steerability, as demonstrated by an evaluation of dishwasher detergents for professional use performed in 2007 (Nordic Ecolabelling, 2007).

Dishwasher detergent for professional use contains ingredients such as surfactants, complexing agents, colouring agents, bleach and alkalis. Alternatives with reduced impact on the environment and working environment are available in the first four groups in particular. Large volumes of dishwasher detergent for professional use are used. For example, it is the chemical product most used by hotels and restaurants.

In 2008, the sales value in the Nordic region of dishwasher detergent for professional use equalled that of professional cleaning agents. Due to the large quantities used in restaurants and hotels in the Nordic area, and the chemical impact of the product group, the Nordic Swan Ecolabelling of dishwashing detergent for professional use is most relevant.

There is potential in the Nordic Swan Ecolabelling of dishwasher detergent for professional use since there are considerable differences between the products on the market. Products containing sodium hypochlorite are found, especially in areas with very hard water. Further, the anaerobic non-biodegradable surfactants NTA and sometimes EDTA[1] are used (Nordic Ecolabelling, 2007). It is however possible to differentiate the best candidates for Nordic Swan Ecolabelling.

Nordic Ecolabelling is also able to steer the environmental impact of dishwasher detergents for professional use. Many users choose environmentally conscious products. Ecolabelling can assist producers to steer towards products with improved environmental performance. In particular, Nordic Swan Ecolabelled service providers

[1] New findings suggest that the only risk with EDTA is that it is persistent. The products have relatively low levels of phosphorous and wastewater is often treated in municipal sewage works

choose Nordic Swan Ecolabelled products. But preference for environmentally conscious products is widespread in the public sector and many companies.

Criteria version and validity

The criteria were first adopted on 15 June 2003. Version 1.0 was valid until 15 June 2006.

On 10 June 2005, the Nordic Ecolabelling Board decided to extend the validity of the criteria by two years. The new criteria document, version 1.1, was valid until 15 June 2008.

On 14 June 2007 the Nordic Ecolabelling Board decided to prolong the validity of the criteria with one year and extend the product group to include presoaks. The new criteria document was released as version 1.2 and valid until 30 June 2009.

On 10 June 2008 the Secretariat Manager's Meeting decided to prolong the validity of the criteria a further one year. Criteria version 1.3 was published with validity until 30 June 2010.

12 months prior to the expiry date of this criteria document at the latest, the Nordic Ecolabelling Board provides information on future ecolabelling criteria.

With this revision, the criteria version has been changed to version 2.0 and the expected expiry date is 30 June 2014.

The Secretariat Managers Meeting decided on 16 February 2011 to change R13 Phosphorus and to make an adjustment in the chapter "Sales in other Nordic countries". The new version is called 2.1.

The Secretariat Managers Meeting decided on 15 December 2011 to adjust the product group definition in order to clarify that also products destined for use in washer-disinfectors in instrument maintenance within health-care are covered by this criteria. Annexes 2 and 3 were adjusted and a couple of other minor corrections were made. The new version is called 2.2.

On 12 December 2012 the Nordic Ecolabelling Board adopted a change in R10. The new version is called 2.3.

The Secretariat Managers Meeting decided on 15 May 2013 to prolong the validity of the criteria document with 21 months. The new version is called 2.4 and it is valid until 31 March 2016.

On 22 October 2014 the Board of Directors adopted a change in R10 Environmentally hazardous substances, where enzyme/subtilisin classified H411 is exempted from the requirement. The new version is called 2.5.

The Nordic Ecolabelling's Criteria Group decided on 17 March 2015 to prolong the validity of the criteria document with two years. 17 November 2014 the Board of Directors decided to remove requirement R29 Marketing. The new version is called 2.6 and it is valid until 31 March 2018.

Nordic Ecolabelling's Criteria Group decided on 7 February 2017 to prolong the validity of the criteria with 24 months to the 31 March 2020. The new version is called 2.7.

The Nordic market

The Nordic market for dishwasher detergent is large in comparison to other product groups. See Table 1 for approximate sales. The sector has few but large actors, some of which are international. Changes that are imposed in the Nordic area can produce environmental benefits even in other parts of Europe.

Table 1. Nordic market 2008/2009

Country	**Total turnover**
Denmark	DKK 85 million
Norway	NOK 120 million
Sweden	SEK 230 million
Finland	€17.8 million
Total in the Nordic region	Approximately 66,7 million €

Many products in this segment are Nordic Swan Ecolabelled compared to other product groups. The criteria for grocery stores, restaurants and hotels stipulate the use of a proportion of ecolabelled chemicals, of which dishwasher detergent for professional use is one product, increasing interest in this product group. Many customers, above all at hotels, are environmentally conscious and choose ecolabelled products.

The number of licenses is somewhat misguiding since each licence can apply to several products. The number of Nordic Swan Ecolabelled products on the market is considerably greater than the number of licences. For example the seven licenses at the Danish market contain 49 different products.

Country	**Number of licences**	**Number of registrations**
Denmark	5	2
Norway	1	4
Sweden	8	2
Finland	2	3

Finland

Approximately 40% of products sold on the Finnish market carry the Nordic Swan Ecolabel. There are four international players on the market and several Finnish companies that produce dishwasher detergent for professional use.

The products made in Finland are in liquid form. The Finnish producers are relatively small. They focus on customer service and (regularly) visit virtually all of their customers. Approximately half of the companies on the Finnish market have Nordic Swan Ecolabelled products in their product range.

Norway

Approximately 45% of products sold on the Norwegian market carry the Nordic Swan Ecolabel. The major actors are three international brands and one Norwegian producer. The products made in Norway are liquid. The Norwegian producer has regular contact with customers through training and visits.

Sweden
JohnsonDiversey and Ecolab are the primary players on the Swedish market. Other manufacturers include Diskteknik, Jasico, Rekal Svenska AB, Aksab Kemi AB, Diskbolaget AB and MacSerien Servicecenter AB. These are Sweden's leading manufacturers and suppliers of dishwashing detergent for restaurants and institutional kitchens. Dishwasher detergent in powder, solid and liquid form is manufactured and sold in Sweden. The products are intended for professional use and the public sector in the Nordic area and parts of Europe.

Denmark
The proportion of Nordic Swan Ecolabelled products is lower in Denmark than in the other Nordic countries at 10-20% of the market share. There are two major suppliers, Ecolab and JohnsonDiversey. There are also many small producers and importers. The small producers sell their products through local distributors. The majority of products are in liquid form.

Other labels and control systems

European Ecolabel –the EU Ecolabel
The European Eco-label, the EU Ecolabel, has criteria for dishwasher detergents for domestic machines but not for professional use.

Good Environmental Choice
The Swedish Society for Nature Conservation has ecolabelling criteria, Good Environmental Choice, covering dishwasher detergents for both domestic machines and automatically dosed machines (Swedish Society for Nature Conservation, 2006). Rinse aids that are used for dishwashing are not covered by the specification but form a separate product group. There are currently approximately 15 Good Environmental Choice dishwasher detergents for professional use (Swedish Society for Nature Conservation, 2009).

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. In addition, the product's "degree of domestic origin" is assessed, taking into account primary products, packaging materials and marketing costs. The "degree of domestic origin" must be at least 50%. It is a registered trademark that is administered by Förbundet för Finländskt Arbete (Federation for Finnish Work). It is not an ecolabel though many consumers believe it to be such.

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.

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, 2009).

Criteria development/revision

Purpose of the revision

The criteria for dishwasher detergent for professional use, version 1.3, were valid from 15 June 2003 until 30 June 2010.

The purpose of the revision is to present proposed revised criteria that are based on the conclusions of the 2007 evaluation.

Detailed aims
The revision of these criteria focuses on the following areas and parameters:

- Compare the criteria and the DID list.
- Investigate/evaluate complexing agents on the market.
- Investigate/evaluate the function of and market for presoaks.
- Revise the visit report template.
- Energy consumption during usage. Possible inclusion in user instructions.
- The effect of awareness regarding dosing (since excessive dosing has unnecessary impact on the environment).
- Health risks: Chemicals can constitute a hazard in the working environment, e.g. by direct contact or inhalation.

About this criteria revision

This criteria revision was performed on assignment from Nordic Ecolabelling under the project leadership of Susanna Vesterlund (Sweden). Jeppe Frydendal was the Nordic area coordinator.

Project participants:
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Norway: Arne Godal
Finland: Terhi Uusitalo

The criteria have been revised in close collaboration with producers, manufacturers and major consumers. To get the most out of criteria development, a mini-draft was sent for comment prior to the draft proper. Producers, suppliers, major consumers and other stakeholders were asked to comment on matters such as the user test and customer visits, but also to answer numerous questions about the products.

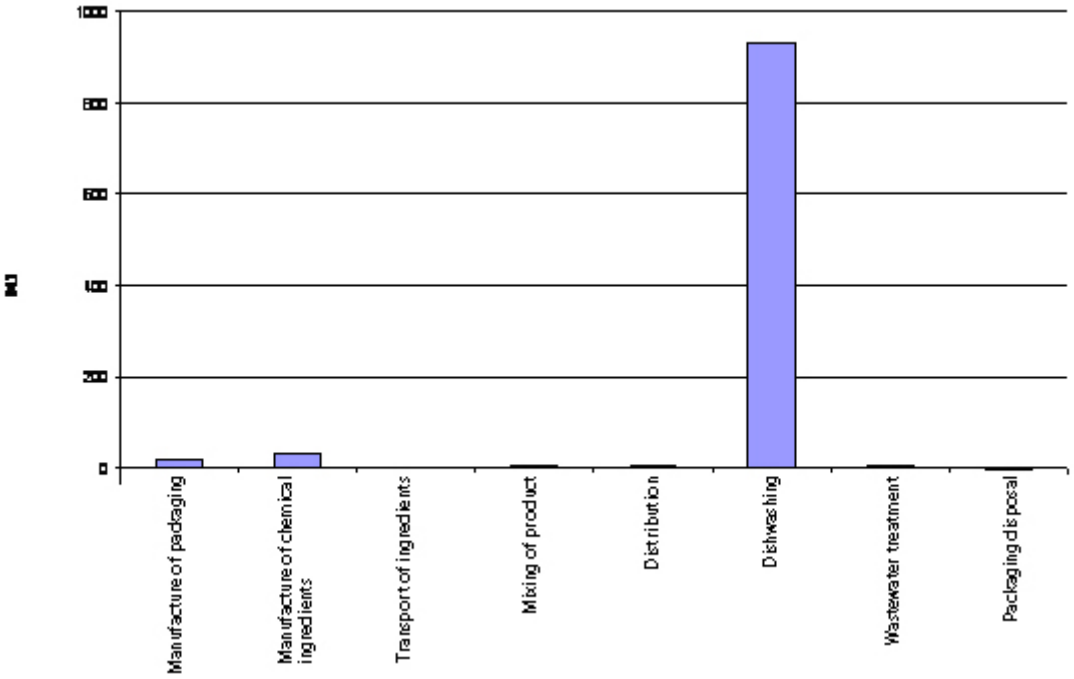
Justification of the requirements

Introduction
Considering dishwasher detergent for professional use from a lifecycle perspective, it is interesting to note that the vast proportion of the environmental impact occurs following the detergents manufacture.

Energy
Screening shows (Nordic Ecolabelling, 2009) that 95% of the energy consumption associated with a generic liquid detergent (Figure 1) occurs in the usage phase, i.e. during dishwashing to heat the water and power the machine. This also means that climatic impact primarily results from this phase. The figures provide an indication of the different importance of the various stages of the lifecycle.

Note that rinsing agent is not included in this overview. The consumption of rinsing agent is considerably smaller, and the additional energy required by rinsing agent does not have a significant impact on the total energy consumption.

Figure 1 Energy consumption for a generic liquid product.



This means that by focusing on high performance at low water temperatures, the criteria would have significant potential to reduce the energy consumption of the washing process, which is the most important aspect from a lifecycle perspective.

However, professional and domestic dishwashers work differently. Restaurant and institutional kitchens require fast washing cycles (as short as 2 minutes), which necessitate a high water temperature (Nordic Ecolabelling, background document 1.0, 2003). It is currently difficult to envisage low-temperature products for dishwashers for professional use.

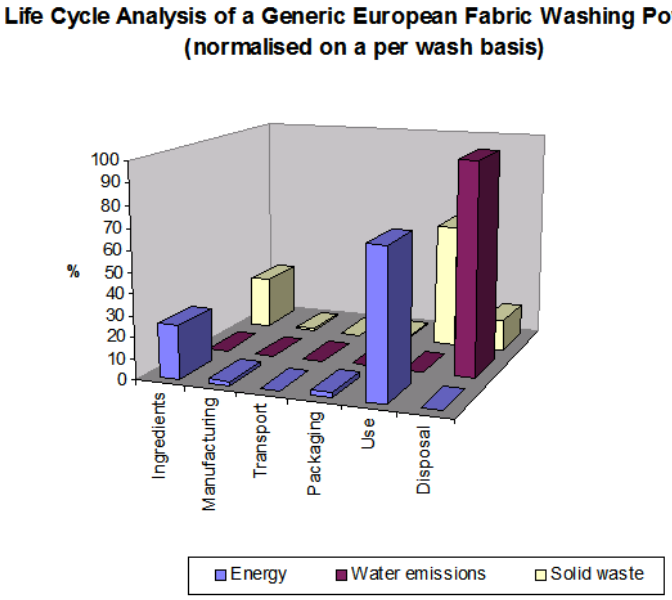
If Nordic Ecolabelling criteria aim to save energy they should focus primarily on ensuring that the dishwasher is well filled, that the water temperature is as low as possible and that clean dishes are removed so that the machine is not left idling for extended periods. There is great potential to save energy here (Nesa, 2009).

Chemicals

Chemical impact is very important from an environmental perspective. In a similar way as to energy, analysis shows that the most significant impact from chemicals results from the emissions in waste water.

Accordingly, the criteria should focus on the inherent properties of the ingredients (biodegradability, ecotoxicity, eutrophic potential, etc.) performance (to avoid rewashing) and the assurance of correct dosage. This is a conjecture based on a lifecycle analysis of laundry detergent, which is similar in many ways. An A.I.S.E. report shows that the most significant emissions occur during the waste phase, as shown in Figure 2.

Figure 2: Life cycle analysis of a generic European fabric washing powder



Health hazards

The chemicals in the product may constitute a hazard in the working environment if personnel in the kitchen are exposed to the chemicals, either through direct contact with the product, inhalation or similar. The criteria should therefore also focus on a product's health aspects to reduce the work environment risks. Regarding enzymes, the criteria also take into regard the work environment risks of the production of enzymes.

Performance/Customer visits

It is essential that ecolabelled products are effective, since effective products reduce the amount of detergent that is discarded and the risk of excessive dosing.

Miscellaneous

The use of sustainable raw materials is a priority area for Nordic Ecolabelling. For example, requirements are set on renewability and reduced impact on biodiversity, as well as social and ethical aspects. This is usually realised by a requirement that the raw material in question complies with Nordic Ecolabelling's approved certification programmes, such as FSC and PEFC regarding forestry.

Regarding these particular criteria, there are several reasons why we have chosen not to set requirements on sustainable raw materials:

- Lack of relevance. The majority of ingredients in dishwasher detergent for professional use are inorganic.
- Lack of steerability. It can be very difficult for the producer to trace an ingredient many steps back in the production chain, such as to a specific palm oil plantation.
- Lack of steerability and potential. There are currently too few third party certification systems for the ingredients in chemical products. Accordingly, there are not enough certified products on the market.

A requirement on sustainable raw materials is not stipulated in these criteria since it does not have a high relevance to the product group.

Renewable raw materials are not relevant for dishwasher detergent for professional use since these products contain few ingredients that can be replaced by renewable such. Surfactants are primarily an ingredient of rinse aids, of which volumes are relatively low.

Requirements

The criteria comprise requirements specific to individual products and requirements regarding all components in a dishwasher detergent for professional use or multi-component system.

Several of the most common substances have been assessed by Nordic Ecolabelling and are described in a separate DID list. The specified parameter values must be used for all ingredients on the DID list, Part A, dated 2007 or later. The applicant shall document other substances. The documentation shall be of good scientific quality and relevance. The methods for use on ingredients that are not listed on the DID list are described in the guidelines in Part B of the DID list.

All limit values exclude water. The limit values are set based on Nordic Ecolabelling's experience of the product group. A total of 28 recipes have been available. Of these, the majority have been products ecolabelled according to the criteria for dishwasher detergents for professional use.

The requirements are set to reduce the obvious environmental impact of dishwasher detergent for professional use, such as the emission of chemicals. The waste water passes via the sewage system, and often also a sewage works, to the recipient. This requires that the levels of environmentally hazardous substances in waste water and sludge from sewage works are as low as possible.

Environmental requirements

Section 1.2 specifies requirements that apply to a single component detergent or an entire multi-component system. The requirements in Section 1 apply to all ingoing substances unless specified otherwise.

The definition of ingoing substances has been adjusted in accordance to Nordic Criteria Group meeting on February 7th 2018 and is now as follows.
The requirements in the criteria document and accompanying appendices apply to all ingoing substances in the Nordic Swan Ecolabelled product. Impurities are not regarded as ingoing substances and are exempt from the requirements.
Ingoing substances and impurities are defined below, unless stated otherwise in the requirements

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

- Impurities in the raw materials exceeding concentrations of ≥ 10000 ppm (≥0,1000 w-%, ≥10000 mg/kg) are always regarded as ingoing substances, regardless of the concentration in the Nordic Swan Ecolabelled product.

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

The last sentence about released substances is not a making the criteria stricter compared to the previous set of criteria, where it is not explicated written. Nordic Ecolabelling has always interpreted the term "constituent ingredient" in this way, so this is only to specify the requirement.

R1-R2 Description of product and recipe

To evaluate whether the product is eligible for the product group, the criteria require a description of the product and its area of use as well as information enabling identification of the producer.

Nordic Ecolabelling requires an exact recipe with all constituent substances or the exact recipe of each component in a multi-component system. This is needed to check each requirement and perform the calculations stipulated by the requirements.

R3 Classification of the product

It is Nordic Ecolabelling's policy that products classified as environmentally hazardous may not be awarded the Nordic Swan Ecolabel. (Nordic Ecolabelling, 2006)

The risk of direct contact with dishwasher detergents and rinse aids that are dosed automatically is small. There is however a risk of exposure to dishwasher detergents, rinse aids and presoaks if they are dosed manually or when containers or hoses are changed. To protect the user Nordic Ecolabelling therefore also prohibits several product classifications due to their harmful and work environment characteristics. Products classified as H302 (Harmful if swallowed) are not banned completely. The reason is that the product is designed for professional use meaning it is fair to assume that no children will have access to the product. Also, the majority of dishwashers have automatic dosing making the risk of ingestion minimal.

Exceptions have been made for classifications with Acute Toxicity Category 4 med H332, H312 and/or H302 which are ok if the packaging is designed so that the user does not come in contact with the product. Packaging where the user does not come in contact with the product are for example products packed in material to be directly connected to an automatic dosing system or products which are directly pumped into the machine.

Exception for products classified as Skin Corr 1A, 1B or iC, H314 for automatically dosed products and manually dosed presoaks where the in-use-solution is not classified as corrosive at the highest recommended dosage. Corrosive manually dosed presoaks have to be sold with a pump for dosing or be connected to via product hose to a water source mixing the product to an "in-use-solution". The pump needs to be designed to provide correct dosage at the same time as it is minimizing the risk of exposure.

Products in containers smaller than 1 litre do not need to be sold together with a pump if the packaging has a childproof closure in accordance with ISO 9327:2004.

Smaller containers for manually dosing are easier to handle than for example 5- and 10 litre containers, and therefore decrease the risks of injuries. People using these products have a lot better knowledge about the risks compared to the consumers.

The Nordic Ecolabelling's Criteria Group decided on 7 February 2018 to adjust the requirements K3, K4 and K10 and delete references to expired legislation and reference only to the CLP Regulation 1272/2008 (EU, 2008).

R4 Classification of constituent substances

To reduce the risk to users further, Nordic Ecolabelling prohibits substances in the final product or in the ingredients carrying certain classifications. These classifications are sensitising, carcinogenic, mutagenic and reproduction toxic.

Enzymes are exempted from this requirement regarding sensitisation since all enzymes are classified that they may cause sensitisation by inhalation (R42/H334) and some even by skin contact (R43/H317). Enzymes in professional dishwasher detergent are not expected to cause allergy issues to the user since they may not be incorporated as "free dust" but must be incorporated in the product. Dishwasher detergent for professional use is usually dosed automatically and the risk of exposure is therefore minimal. Enzyme ingredients must also be in a dust-free form during production (e.g. granulate or liquid).

To prevent work environment problems related to sensitising substances, R7 states specifically that all enzymes must be incorporated in a dust-free granulate or liquid form and not in aerosols.

Preservatives are also exempted regarding classification as sensitising. Preservatives are necessary to ensure the quality and durability of products. As mentioned previously, the risk of exposure to dishwasher detergent for professional use is minimal. The risk of contact with sensitising substances in the detergent is therefore also minimal. The advantages of preservatives outweigh the risks of sensitisation.

As in K3 the Nordic Ecolabelling's Criteria Group decided on 7 February 2018 to adjust the requirement K4 and delete references to expired legislation and reference only to the CLP Regulation 1272/2008 (EU, 2008).

R5 Surfactants

Surfactants are generally used in rinse aids and presoaks but are sometimes found in dishwasher detergents. It is therefore relevant to set requirements on the biodegradability of surfactants.
All surfactants (irrespective of function) must be readily biodegradable and anaerobically biodegradable. 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 prescribes that surfactants shall be aerobically biodegradeable, but there is a possibility to get an exception from this for professional products. Placing a product on the market does not always mean that they fulfil the legislation, even if they of course should. Reports have shown that all surfactants do not degrade before leaving the waste water treatment plant. It is therefore very important to have requirements for degradation under both aerobic and anaerobic conditions for this product group.

R6 Enzymes

Enzymes are not usually used in dishwasher detergents for professional use. Nor are they used in drying and presoaks. But with the current focus on climate change and energy consumption, it is not unreasonable to predict that dishwashing detergents that are more effective at lower temperatures will be developed. And that these will contain enzymes. Therefore, Nordic Ecolabelling should keep one step ahead and set criteria on enzymes already at this point in time.

The requirements are designed to protect workers during the production and use of the detergent. This is done by ensuring dust-free ingredients. The requirements prohibit enzymes in spray products, since due to the increased risk of exposure to such products. This is since presoaks, for example, may in the future be sold as sprays.

Proteas (Subtilisin, EINECS 232-752-2, CAS 9014-01-1) is now reclassified as environmental hazardous with Aquatic Chronic2 (H411) regarding to the new regulation for long term testing of chronic toxicity, even though protease is easily degradable. Studies show that more than 99.99% of subtilisin is deactivated in treatment plants or in the sewage system on the way to the treatment plants. Subtilisin is an effective enzyme which is used primarily in laundry detergents (professional and consumer) and dishwashing (professional and consumer) to break down proteinbased stains. An exemption from the requirement regarding environmental hazardous substances is necessary for the manufacturers to be able to continue producing well-functioning dishwasher detergents for professional use. Protease can only be added in amounts that will not have an impact on the final products classification, meaning it will not cause more products with environmental hazardous classification.

Proteas/subtilisin classified as Aquatic Chronic 2 (H411) is exempted from R10 Environmental hazardous substances.

R7 Prohibited substances

There are several problematic substances that are difficult to prohibit through require-ments on the product's chemical composition. Accordingly, Nordic Ecolabelling has compiled a list of substances that may not be added to the product or be found in compounds at concentrations above 100 ppm. The aim of the list is to prohibit only the substances that are not covered by other requirements. The list includes however APEO, APD, LAS and DADMAC. These are included here, despite being prohibited by the surfactant requirement, to simplify administration and since they are sometimes designated as other than a surfactant.

Fragrances may be toxic to aquatic organisms, not be readily biodegradable, allergenic and/or bioaccumulating. They have no essential function in dishwasher deter-gents for professional use. Unnecessary chemicals cause unnecessary environmental impact.

Accordingly, fragrances are prohibited. The requirement is formulated in accordance with Nordic Ecolabelling's draft universal fragrance study (Nordic Ecolabelling, 2009a).

Reactive chlorine compounds, such as hypochlorite, are toxic but degrade quickly since they are reactive. Since they react with organic substances, organic chlorine compounds can form in the waste water system. These may be toxic, persistent and bioaccumulable. Alternative, less environmentally hazardous bleaches are now available. It is therefore stipulated that reactive chlorine compounds may not be added. Reactive chlorine compounds include hypochlorites, chlorine gas, chloramines (NH_xCl_y) and chlorine dioxide (ClO_2).

Perborates are sometimes used as bleaching agents. Several perborates will soon be classified as harmful to reproduction (EU, 2008b). This classification has just been in forced and Nordic Ecolabelling therefore still wishes to ban these substances even if they are not allowed in requirement 4.

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. Nordic Ecolabelling has however found them present in ingredients. The substances are prohibited by the surfactant requirement. They may however be defined as something other than surfactants and are prohibited here to simplify administration.

NTA is classified in the CLP Regulation as Carc Cat.3 (EU, 2008b). Since the CLP regulation has yet to come into force, Nordic Ecolabelling has decided to list NTA under the prohibited substances to simplify licensing. Complexing agents replacing NTA (GLDA and MGDA) contain small quantities of NTA impurities from production (as specified on the MSDS for the ingredient). NTA is only allowed in 0.1% in the final product. These small quantities are permitted in this version of the criteria to promote a transition to MGDA and GLDA. Research in the area shows (according to BASF) that NTA is only carcinogenic in crystal form. Crystals are not found at low concentrations (NMN, 2008).

EDTA is 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). EDTA has been permitted in previous criteria versions for professional dishwasher detergent (version 1.4). 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 (Official Journal of the European Union, 2006/C 90/04).

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, 2008b). Nordic Ecolabelling prohibits the use of substances that are potential endocrine disrupters 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 disrupters (EU, 2000) or subsequent studies (EU, 2002a, 2000b and 2007). See http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf.

The prohibition of **nanomaterials/particles** based on metal, carbon and/or fluorine compounds in Nordic Swan Ecolabelled products is based on a cautionary principle (Nordic Ecolabelling, 2009b). Nanoparticles are defined as microscopic materials that in at least one dimension are smaller than 100 nm. We have no evidence that dishwasher detergents for professional use contain nanomaterials. Nanoparticles are however used in other chemical products (e.g. antibacterial nanosilver and in coatings) (Nordic Ecolabelling, 2009b). Therefore a ban on nanoparticles based on metal, carbon or flourine compounds is included in the dishwasher detergent criteria.

PBT (**Persistent, bioaccumulable and toxic**) 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 dishwasher detergent for professional use by the restrictions on environmentally harmful substances (see R5). Since some substances, above all vPvB, are not excluded by R5, Nordic Ecolabelling prohibits these directly.

Substances that are inherently PBT or vPvB, or substances that form compounds that are PBT or vPvB can be found on the European Chemical Bureau's website. http://ecb.jrc.it/esis/index.php?PGM=pbt (ECB, 2009).

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

LAS (linear alkylbenzene sulphonates) is a group of surfactants that are not anaerobically biodegradable and are therefore undesirable. The substances are prohibited by the surfactant requirement. They may however be defined as something other than surfactants and are prohibited here to simplify administration.

DADMAC (Diallyl dimethyl ammonium chloride) is a group of cationic surfactants with very high ecotoxicity and poor aerobic degradability, and that are not anaerobically biodegradable (little data exists regarding this). Accordingly, DADMACs are undesirable. DADMACs are prohibited by the surfactant requirement. They may however be defined as something other than surfactants and are prohibited here to simplify administration.

R8 Preservatives

Preservatives are added to liquid products to prevent bacterial growth.

In general, preservatives are highly toxic to aquatic organisms and can produce hypersensitivity and allergies. Preservatives can be used in the product 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 measured BCF, the highest measured BCF determines the substance's bioaccumulation potential

There are different values on the bioaccumulation factor for Triclosan Nordic Ecolabelling will consider it as worst case, ie bioaccumulative. Triclosan can therefore not be included in the products.

R9 Colouring agents

Colouring agents do not clean but may be considered necessary for the product group for safety reasons to enable the differentiation of different products.

Colouring agents may be added to products if they are not bioaccumulating. Colouring agents are considered bioaccumulating if BCF < 500 or $\log K_{ow} < 4.0$. If both BCF and $\log K_{ow}$ values are available, the highest measured BCF values shall be used. Colouring agents approved as food additives can be used, since they are supposed to be evaluated as safe.

R10 Environmentally hazardous substances

Requirements are set on the environmental classification of constituent substances to limit the use of environmentally hazardous such. Since all the products ultimately end up in the aquatic environment, the toxicity of the substances is relevant to ecolabelling. The requirements limiting the quantity of environmentally hazardous substances promote manufacturers to use alternative products that are not classed as environmentally hazardous.

A review of current licences shows that the use of environmentally hazardous substances is not widespread. However, since they can be used, requirements are set on the permitted quantities. Accordingly, the use of substances with the following classifications is limited: Category Chronic 1: H410, Category Chronic 2: H411, Category Chronic 3: H412.

- Hazardous to the aquatic environment, Category Chronic 1: H410
- Hazardous to the aquatic environment, Category Chronic 2: H411
- Hazardous to the aquatic environment, Category Chronic 3: H412

It is proposed to change the requirement by limiting Category Chronic 1: H410 compounds the most by weighting the different classifications.

H400 (Very toxic to aquatic organisms) is not on the criteria anymore, since these substances are limited by the CDV.
Substances with high toxicity (low L/EC50-value) and thereby classified with H400 lead to high CDV-values and is therefore limited by the CDV-calculation.

Substances without information about environmental effects are considered as ”worst case”, i.e. as H410.

Proteas/subtilisin classified as Aquatic Chronic 2 (H411) is exempted from the requirement, see further handling of enzymes i requirement R6. Note that the product also must fulfil the requirement R3 regarding classification of the product.

The unit for the sum of the substances classified as environmentally harmful substances was changed to ”per litre water” after the hearing. The new value has been calculated using the same data as the proposed limit in ”per kilogram product” in the hearing, but calculated with a common dosage.

As in K3 and K4 the Nordic Ecolabelling’s Criteria Group decided on 7 February 2018 to adjust the requirement K10 and delete references to expired legislation and reference only to the CLP Regulation 1272/2008 (EU, 2008)

R11 Critical Dilution Volume (CDV)

CDV is a measure of the products combined toxicity and biodegradability. The inherent properties of all constituent ingredients and dosage in use influence the CDV value. By setting requirements on this parameter, Nordic Ecolabelling steers dishwasher detergent for professional use towards a lower overall toxicity and constituent substances with considerably better biodegradability.

With reference to the criteria for prioritised risk reducing substances, the use of substances that following single, short-term, repeated or long-term exposure to small concentrations may cause temporary or permanent damage should be minimised. The limit values for $CDV_{chronic}$ and CDV_{acute} promote the reduced of substances of high acute and/or high chronic toxicity.

Due to relatively few formulations and since the CDV calculations are applied for the first time to this product group, a limit value has been chosen that will exclude the products with worst environmental performance. There are products on the market, that are not Nordic Swan Ecolabelled with for example hypochlorite, with much higher CDV-values.

R12 Aerobic Non-Biodegradable Organics (aNBO) and Anaerobic Non-Biodegradable Organics (anNBO)

Organic substances with poor biodegradability properties may effect the environment even if they do not show any acute toxic effects. Substances that degrade slowly have a longer toxic effect and involve a higher risk of harming the environment. Ready biodegradability is therefore desired under aerobic and anaerobic conditions. Furthermore, knowledge about the long-term environmental effects of persistent substances is often inadequate. Requirements are set for the proportion of the product that may be aerobic non-biodegradable and anaerobic non-biodegradable.

The limit has been made stricter since the last version of the criteria.

Cumene sulphonates and iminodisuccinate (IDS) and are exempted from the requirements on anaerobic biodegradability, and shall not be included in the calculations.

Cumene sulphonates are used as hydrotropes. These have several important functions such act in as stabilizers, solubilizers, defoamers and viscosity regulators. They are readily

biodegradable, i.e. >60% readily biodegradable according to OECD 301B, and have low potential bioaccumulation with $logK_{ow}$ of -1.5.

Cumene sulphonates (DID no. 139) are according to the DID list not readily biodegradable but exhibit potential biodegradability and are valued as anaerobic non-biodegradable. All data that we have collected (from the IUCLID database and HERA project) suggests ready biodegradation. At the same time, data from substances that are readily biodegradable but with inconclusive data on anaerobic biodegradation and low logKow, can with all likelihood be omitted from the calculation of aerobic non-biodegradable substances.

IDS is used as a complexing agent and is one of the alternative complexing agents on the market. It can for example replace phosphates. Sodium iminodisuccinate is readily biodegradable and is not bioaccumulating: biodegradation of 79% according to OECD screening test (modified). Biodegradation according to the Zahn-Wellens Test is 89%. DOC determination. Readily biodegradable. Anaerobic biodegradability: 39% after 56 days according to ISO 11734, $logK_{ow}$ = -3.93.

R13 Phosphorous

The use of a limited amount of phosphorous is permitted. Phosphorous and nitrogen are the primary causes of eutrophication. One result of the eutrophication of lakes, seas and waterways is oxygen deficiency, which leads to dead bottom zones.

Phosphates cause eutrophication, which is one the Baltic's greatest problems (The Baltic Sea Portal, 2009). Only 3% of Finland's phosphate emissions to the Baltic comes from municipal sewage (The Baltic Sea Portal, 2009). This quantity is small compared to agriculture, which produces 31% of Finland's phosphate emissions. Nordic Ecolabelling does however wish to limit the quantity of phosphorous in ecolabelled dishwasher detergent for professional use since improvements should be made wherever possible.

Phosphorous is primarily permitted for areas with very hard water. Phosphates bind calcium and assist the action of surfactants. A small quantity of phosphate in the laundry and dishwasher chemicals helps make the washing process effective without the use of a large quantity of active detergents. The majority of waste water from professional dishwashers goes to municipal sewage treatment with traps for phosphorous.

The limit for phosphorous in dishwasher detergent of 0.08 g/l of dishwater is based on calculations using the Norwegian (legislative) limit of 3.8% phosphorous and a dosage of 2 g/l. This requirement is more stringent than in the previous version. The limit for rinse aids of 0.04 g/l is unchanged from the previous criteria.

We have after the hearing added a maximum limit of 3.8% phosphorus to make sure that all Nordic Swan Ecolabelled products will fulfil the Norwegian legislation, which is the most stringent legislation on phosphorous in the Nordic countries (*Product control regulation: FOR 2004-06-01 nr 922: Regulations relating to restrictions on the manufacture, import, export, sale and use of chemicals and other products hazardous to health and the environment. Section: 3-8. Detergents – phosphorous content).* The limit of 3.8% by weight phosphorus in the product was removed after a decision taken by NMN, 17 March 2011. The background to this decision was that information was received showing that the limit disfavors highly concentrated products.

The reason for adding the requirement of limiting the phosphorus to 3.8% by weight in the first place was a wish that all Nordic Swan Ecolabelled products should fulfill the environmental legislation in all Nordic countries, where Norway is the country with the strictest legislation on concentration limits for phosphorous. Something shows that the time is not ready for such a requirement yet, since it causes some unforeseen consequences for highly concentrated products.

Highly concentrated products contain less water and therefore less transportation of water and also less packaging material, which is an environmental gain. These products are mainly automatically dosed, so the risk of overdosage is small even with low dosages. With support of the following two points it was therefore decided to remove the limit of 3.8% by weight phosphorus in the products in this version of the criteria (version 2).

1. Information has shown that the alternative rawmaterials to phosphates as complexing agent, such as for example MGDA and GLDA, are not available in large enough quantities to cover the whole market's need of phosphates. This was confirmed by a rawmaterial supplier. This problem will mainly effect producers buying large quantities of complexing agents and who produce highly concentrated products. According to a contacted rawmaterial supplier it will take at least a couple of years before the demand of alternative complexing agents to phosphates can be fulfilled.
2. It is also technically important to set the phosphorus requirement per functional unit (dosage) and not on a maximum percentage in the product. Such a requirement is already in the criteria document. The phosphorus per functional unit should technically be the governing requirement, since that is what ends up in the sewage. A maximum limit for phosphorus in the final product will punish the highly concentrated products with a low dosage to a higher extent than other products. At a low concentration, under 2g/l, the requirement of maximum 3.8% by weight phosphorus will be the governing requirement. This would lead the Nordic Swan Ecolabel to favour more diluted products with a higher dosage (≥ 2g/litre).

The requirement in the criteria document is now only based on the amount of phosphorus per functional unit. Products sold and marketed in Norway still need to fulfill the Norwegian legislation requirement of a maximum of 3.8% phosphorus in the final product. The requirement of maximum 3.8% by weight phosphorus in the final product may be evaluated again during the next revision of the criteria document together with an overview of the situation on the market at that time.

The reason for not prohibiting the use of phosphates is there are few alternative complexing agents now NTA is classified and EDTA is banned. Further, banning phosphates would likely increase the use of complexing agents, which are not readily biodegradable. At the same time most of the effluent from B2B use ends up at local sewage treatment plants with phosphorus precipitation.

R14 Phosphonates/phosphonic acids

Phosphonates are not generally readily biodegradable, and may increase the mobility of heavy metals in sewage works and nature. Phosphonates have a relatively high acute toxicity to aquatic organisms. Small quantities of strong complexing agents are required to stabilise bleaches such as percarbonate and hydrogen peroxide. Due to these inherent properties and that the use of NTA is prohibited (for other reasons) in Nordic Swan

Ecolabelled dishwasher detergent for professional use, the use of phosphonates/phosphonic acids is permitted only in small quantities.

Dosage and packaging

R15 Dosage

The performance of the product must be good to enable it use for its intended purpose. Products in powder form, in particular, must be easy to dose, readily soluble and must not clog the dosing system. Therefore, the applicant must demonstrate that the product performs well and:

- Doses well through an automatic dosing system.
- Does not compress if stored in sacks.
- Dissolve readily in the in-use solution.
- Must rinse easily.

R16 Packaging

Two requirements are set of packaging. Firstly, plastic materials must be marked in accordance with DIN 6120 part 2 or equivalent. Small parts under 5 grams are excluded since it is difficult to mark them. The aim of this requirement is to make sorting and recycling simpler when the product is finished. The marking of the packaging can also show that it is not made of PVC and thereby informs the customer and gives the Nordic Ecolabelling increased possibility for control/steerability.

The second requirement concerns PVC and other halogenated plastics that must not be used for packaging or labels. This requirement prevents the use of plastic materials that can be problematic during manufacturing and if the material is incinerated. PVC is sometimes used in labels.

Mandatory information

R17 Declaration of ingredients

The declaration of ingredients shall comply with EU detergent regulation 648/2004/EC.

This requirement aims to minimise the information to the user about ingredients. Although the requirement simply stipulates adherence to legal requirements it fulfils a purpose by highlighting the legal requirements and including these in the assessment of the application.

R18 Mandatory information

Product information must include recommended dosages for appropriate water hardness (for the area where the product will be used) values to simplify dosing for the user and to reduce the risk of excessive dosing.

R19 User instructions and environmental advice

Energy and chemical content are the most significant parameters for dishwasher

detergent for professional use from an environmental perspective, which is also highlighted in the introduction to the requirements.

To save energy and benefit the environment it is important to attempt to wash full machines, ie where it is possible and with the dishes stacked after size and in the right baskets. To use the lowest temperature possible resulting in hygienic dishes, means that the temperature should not be set higher than what is required.

The other important environmental impact that a dishwasher has comes from chemical use. To avoid the unnecessary use of chemicals it is vital that the detergent is dosed correctly. Even too low dosages must be avoided since this could lead to poor wash results, necessitate rewashing and ultimately use more chemicals. The advice concerning correct dosage is mainly for areas where customers visits are not done and where manually dosed products are used.

The advice concerning the handling of empty packaging means that there shall be information about what to do with empty packaging (such as recycling, reusing/refilling and or garbage sorting) available for the final user. The background to this is to secure that the final user knows what to do with the empty packaging.

Performance, user test and customer visits

R20 Performance

The performance of the single or multi-component system must be satisfactory at the recommended dosage. The performance shall be tested at the same dosage as used for other calculations.

The performance of dishwasher detergent for professional use must be documented through user tests. Since there is no standardised test for professional users are a demanding, Nordic Ecolabelling considers that a user test is the best way to document the performance of the product. The results from at least eight test locations must be documented. The test period must last at least four weeks to attain sufficient supporting data. The product fulfils the Nordic Ecolabelling performance requirements if 80% of test results are judged “satisfactory performance” or “excellent performance”.

The number of test locations submitting test results has been increased from five to eight in this revision to provide a better picture of how the product performs. The requirement that all completed user tests must be submitted to Nordic Ecolabelling provides better grounds for assessing the products performance.

R21 Customer visits and visit reports

It is important that manufacturer pays regular visits to customers that have automatic dosage systems. The aim of this requirement is to ensure that the dosage instructions and dosage system are used correctly to avoid excessive or insufficient dosage. Excessive dosage causes the unnecessary emissions. Insufficient dosage can often result in the need to rewash dishes, which results in increased emissions and water and energy consumption. Documentation of the water hardness is important to obtain an optimized dosage. The total service also includes checking the dosage program and servicing the dosage equipment.

The supplier must also offer to post environmental advice by the dishwasher. This aims to remind the user to wash only full machine, to wash at the lowest temperature possible and not to leave the dishwasher on for extended periods when not in use. It is vital to observe this advice to accomplish an environmental benefit.

The frequency of customer visits is governed by the agreement between the supplier and customer and can vary, but is usually between 1-3 times/year. It is acceptable that a smaller number of customers are not visited on a regular basis. In exceptional cases, a customer visit may be waived if the distance and method of delivery makes the visit impractical and difficult. The customer visit may be performed by a third party, such as a test institute or consultancy firm.

The user phase and thereby the customer visit is an essential part of the license and can have a large influence on the environmental load in the life cycle. No license holder can be excused from the requirement of customer visits at a larger part of the professional users. License holders selling products through wholesalers still need to fulfil the requirement. There is a possibility to let the wholesaler or a third party to perform the customer visits, but the license holder needs to secure the reports and on request have them available for the Nordic Ecolabelling, in connection with random inspections or likewise.

If registering in another Nordic country, the procedures for customer visits must be described since this visits are often performed by a party other than the licensee.

Quality and regulatory requirements

R22-29 Quality and regulatory requirements

This requirement ensures that the holder of an ecolabelling licence is responsible for following safety, working environment, labour, and terms and concessions at the production facility during the 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 Nordic Ecolabelling's Criteria Group decided on the 9 October 2017 to remove requirement K28 Take-back system.

Marketing

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

Appendix 1 Marketing –removed appendix
Appendix 2 Declaration from the manufacturer
Appendix 3 Declaration from the ingredient manufacturer
Appendix 4 Test methods and equations
Appendix 5 User test
Appendix 6 Information on classification

Changes from the previous version

The most important changes since version 1.4:

- Prohibition of EDTA
- Introduction of CDV
- Tightening of limits for biodegradability (aNBO and anNBO)
- Changed calculations and changed limits for environmentally hazardous substances
- Tightened limit for the total content of phosphorous
- Expansion of the product group to include manually dosed professional products and products used in hybrid/semi-professional machines (wash cycle under 20 minutes)
- Changes regarding customer visits and visit reports
- Inclusion of requirements on user instructions/environmental advice
- Addition of CLP classification
- New layout

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New criteria

The criteria for phosphorous will be reviewed and the possibility to forbid phosphate or phosphonates will be evaluated.
The possibility to impose energy requirements will be investigated.
The possibility to omit the exemption for IDS regarding anaerobic biodegradability will be re-evaluated.
Evaluate if CDV values for only chronic CDV can be used.
Evaluate the possibility to give credit (by scoring points or similar) to low water flow in the final rinse to lower the consumption of water. Evaluate the possibility to include requirements on other factors concerning for example problems with the machine.

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Appendix 1 – Overview of chemicals

Dishwasher detergent for professional use often comes in liquid form, but it is also supplied as powder and tablets.

There follows a brief overview of the types of chemicals that are commonly used in dishwasher detergents, rinse aids and presoaks.

Alkalis: With respect to liquid dishwasher detergent in particular, washing performance is in part due to alkali substances saponifying and incorporating fat from the dishes.
Examples of alkalis include NaOH, KOH and silicates.

Bleaching agent: Detergents may incorporate bleaching agents to remove miscolouring that may not be removed during washing. Examples include chlorine bleach but also percarbonates and perborates.

Dispersants: Various dispersants, often polycarboxylates, can be added to bind the dissolved soiling and prevent it redepositing on the articles being washed.

Enzymes: Enzymes are not always used in professional dishwasher detergents. In dishwasher detergent for domestic use, enzymes are used to remove food remains or to improve low-temperature performance.

Colouring agents: Colouring agents are often used in rinse aids so that it is easier to tell the difference between the rinse aid and dishwasher detergent.

Complexing agents: Complexing agents bind calcium, magnesium and other substances. These are necessary for keeping the dishwasher free from mineral deposits and increasing the washing effect. Complexing agents are required most in areas with hard water. Examples include most of Denmark and several towns in Sweden and Finland. In Denmark, phosphates have traditionally been the most popular complexing agents. Phosphates have been controversial for many years due to their eutrophic effect.

They are almost phased out in Sweden and Finland. In Norway, phosphates are not permitted in domestic

dishwasher detergents. Typical complexing agents include phosphates, phosphonates, EDTA (sodium ethylenediaminetetraacetate). MGDA (methylglycinediacetic acid), GLDA (Glutamic acid diacetic acid) and IDS Na salt (sodium iminodisuccinate).

Previously, much NTA (nitrilotriacetic acid) was used but this is no longer permitted in Nordic Swan Ecolabelled products.

Metal corrosion inhibitors: These chemicals make the product kinder on metals. Commonly used are sodium silicates and benzotriazole. The former is most common.

Surfactants: This is a commonly used term for a wide range of surface active substances that are used in almost all detergents. Surfactants are organic substances and/or mixtures that are used in detergents and cleaning agents. They have surface active properties and comprise one or more hydrophilic group and one or more hydrophobic group. Their nature and size means that can reduce the surface tension of water and create a single layer at the boundary between water and air.

Surfactants can be used in small quantities in dishwasher detergents, mainly as antifoaming agents, and in fairly large quantities in rinse aids.