About Nordic Swan Ecolabelled

Dishwasher detergents for professional use

Version 3.10 • 25 November 2021 – 31 December 2027

Nordic Ecolabelling

Content

080 Dishwasher detergents for professional use, version 3.10, 02 December 2025

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

Contact information

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

Denmark
Ecolabelling Denmark
www.svanemaerket.dk

Finland
Ecolabelling Finland
www.joutsenmerkki.fi

Sweden
Ecolabelling Sweden
www.svanen.se

Iceland
Ecolabelling Iceland
www.svanurinn.is

Norway
Ecolabelling Norway
www.svanemerket.no

1 Environmental impact of dishwasher detergents for professional use

Dishwasher detergents for professional use contain alkalis, surfactants, complexing agents, bleaching agents and dispersants, among other things. The products come in liquid form, powder form and as tablets. Dishwasher detergents for professional use are employed in large volumes and are, for example, one of the biggest categories of chemicals purchased by hotels and restaurants. In contrast to domestic dishwashers, dishwashers for professional use have fast wash cycles that require high temperatures.

Dishwasher detergents for professional use affect the environment over the whole of their life cycle. However, the greatest environmental impact occurs after the product has been produced. For example, most of the energy is consumed in the use phase, namely in the washing process to operate the dishwasher and to heat the water. Nordic Ecolabelling therefore sets a requirement that the product's label or accompanying product sheet must carry the following environmental advice: Wash at full capacity as far as possible, avoid over/underdosing, use the lowest possible temperature that delivers a hygienic wash.

When it comes to chemicals, the greatest impact on the environment occurs after use, when the wash water is channelled out to the receiving water via the sewerage system and water treatment plant.[1] Properties such as biodegradability, bioaccumulation and ecotoxicity for aquatic organisms are therefore important environmental parameters for all ingredients.

Dosing and efficacy affect all stages of the life cycle and Nordic Ecolabelling therefore sets requirements in these areas.

In "Closing the loop – An EU action plan for the Circular Economy"[2], the European Commission writes that the transition to a more circular economy is an important element in the EU's work to develop a sustainable, low carbon, resource efficient and competitive economy. The action plan has a clear focus on recycling, particularly with regard to packaging material. Nordic Ecolabelling therefore sets ambitious packaging requirements that support recycling and a circular economy.

1.1 The UN Sustainable Development Goals

Below, the Nordic Swan Ecolabelling of dishwasher detergents for professional is described in relation to the UN's Sustainable Development Goals.

[1] A.I.S.E. (2001): The Life Cycle Assessment of European Clothes Laundering. Report 2: LCA of Compact Fabric Washing Powder & main wash process. A.I.S.E. LCA taskforce.
[2] European Commission. 2015. Closing the loop – An EU action plan for the Circular Economy.

Nordic Swan Ecolabelling actively helps towards fulfilling Goal 12 to "Ensure sustainable consumption and production patterns".

Nordic Swan Ecolabelled dishwasher detergents for professional use have a reduced environmental impact from production, use and through design that promotes recycling of packaging.

Nordic Swan Ecolabelled dishwasher detergents for professional use contribute towards Goal 12 as follows:

- Strict chemical requirements ensure minimal harmful effects on the soil and water environment. For example, by requiring that the chemicals are readily biodegradable and not harmful to living organisms.
- Strict chemical requirements also reduce the amount of hazardous
- substances and promote a healthy life for all. For example, all substances
- classified as carcinogenic, mutagenic, reprotoxic or allergenic and suspected or identified endocrine disruptors on current lists from the EU and national authorities are prohibited.
- Requirements for recycling design of packaging and closures allow the material to be recycled after use thus supporting a circular economy.
- Dosage requirements and that the products must be effective ensure efficient use of resources.
- Prohibition of phosphate consisting of the non-renewable natural resource phosphorus.

Nordic Ecolabelled dishwasher detergents for professional use contribute to other goals in the following ways:

Goal 3: Reduces the use of substances that are hazardous to health and the environment

- All substances classified as carcinogenic, mutagenic, reprotoxic or allergenic and suspected or identified endocrine disruptors on current lists from the EU and national authorities are prohibited.

Goal 6: Limits emissions of hazardous chemicals and contributes to better water quality

- Requirements on biodegradability and that the chemicals are not harmful to living organisms.
- All substances classified as carcinogenic, mutagenic, reprotoxic or allergenic and suspected or identified endocrine disruptors on current lists from the EU and national authorities are prohibited.

Goal 13: Increases the knowledge to limit climate change

- Information on washing full machines as much as possible and washing at the lowest possible temperature to reduce the use of energy.

Goal 14: Reduces pollution in the oceans

- Phosphate is banned and the product's content of phosphorus is limited as it can lead to eutrophication.
- Requirements on biodegradability and that the chemicals are not harmful to living organisms.
- All substances classified as carcinogenic, mutagenic, reprotoxic or allergenic and suspected or identified endocrine disruptors on current lists from the EU and national authorities are prohibited.

Goal 15: Reduces the pollution

- Requirements on biodegradability and that the chemicals are not harmful to living organisms.
- All substances classified as carcinogenic, mutagenic, reprotoxic or allergenic and suspected or identified endocrine disruptors on current lists from the EU and national authorities are prohibited.

2 Justification of the requirements

This chapter presents proposed requirements and explains the background to the requirements and the chosen requirement levels. The appendices referred to are the appendices in the criteria document “Nordic Ecolabelling for dishwasher detergent for professional use”.

2.1 Definition of the product group

Complete dishwasher detergents, multi-component systems, rinse aids and soaking agents for professional use in institutional and large-scale kitchens can be Nordic Swan Ecolabelled.

The criteria also cover products used for instrument cleaning as well as other tools and equipment (such as beds, tripods, wheelchairs) in healthcare (products for washer disinfectors and disinfection machines).

Professional products are defined as products used in machines that have a wash cycle of maximum 20 minutes, which also includes products intended for hybrid/semiprofessional machines. Products used for instrument cleaning in healthcare may be used in machines that have a wash cycle of maximum 30 minutes. There is no maximum time for soaking agents.

Products that cannot be Nordic Swan Ecolabelled in line with these criteria are dishwasher detergents for specialist machines used in food production, dairies and so on, and products that are entirely or partially sold in supermarkets. For these products, see criteria for Nordic Ecolabelling of Cleaning Agents for use in the Food Industry and Dishwasher Detergents and Rinsing Agents.

3 General requirements

The requirements in the criteria document and accompanying appendices apply to all ingoing substances in the Nordic Swan Ecolabelled dishwasher detergents for professional use. 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 1,0% 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.

Note: Any component of the product that enter the dishwasher machine and eventually goes down the drain, is considered as part of the formulation/recipe (eg. water-soluble film, print on film etc.).

O1 Description of the product

The applicant must provide the following information about the product:

- Description of the product's area of use.
- Description of the constituent products if it is a multicomponent system.
- The product's volume or weight.
- All trade names if the product is sold in multiple countries.

✉ Description of the product in line with Appendix 1.

✉ Copy of label and/or product sheet can be sent in as part of the documentation.

Background to requirement O1

A description of the product is needed for Nordic Ecolabelling to be able to assess whether the product fits into the product group definition.

The requirement is unchanged compared with generation 2 of the criteria.

O2 Formulation

The applicant must provide a complete formulation for the product. With multicomponent systems, the formulation must be given for all the separate components. The formulation must contain the information below for each ingoing raw material. If a raw material contains two or more substances, each substance must be declared.

- Trade name
- Chemical name of main component and any additives (e.g. colourants, preservatives and stabilisers)
- Amount (both with and without solvents, e.g., water)
- CAS no. / EC no.
- Function
- DID no.* for substances that may be placed on the DID list

** The DID number is an ingredient's number on the DID list, version 2016 or later, which is used when calculating chemical requirements. The DID list can be obtained from Nordic Ecolabelling's websites, see addresses on page 3.*

✉ The complete formulation of the product as set out in the requirement. Nordic Ecolabelling's calculation sheet must be used. It is available from Nordic Ecolabelling's websites.

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

Background to requirement O2

Nordic Ecolabelling needs the complete formulation for the product in order to check that it meets the requirements.

The requirement is unchanged compared with generation 2 of the criteria.

O3 Classification of the product

The product must not have a classification listed in Table 1.

Please note that the producer is responsible for the classification.

Table 1 **Classification of the product**

CLP Regulation 1272/2008:		
Hazard	**Hazard class and category**	**Hazard code**
Toxic to aquatic life	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Aquatic Chronic 3 Aquatic Chronic 4	H400 H410 H411 H412 H413
Hazardous to the ozone layer	Ozone	H420
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
May cause genetic defects*	Muta. 1A or 1B Muta. 2	H340 H341

Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Acute toxicity	Acute Tox. 1 or 2 Acute Tox. 1 or 2 Acute Tox. 1 or 2 Acute Tox. 3 Acute Tox. 3 Acute Tox. 3 Acute Tox. 4 Acute Tox. 4 Acute Tox. 4	H300 H310 H330 H301 H311 H331 H302 H312 H332 *Exception: Products whose packaging is designed so that the user cannot come into contact with the product may be classified as H302, H312 and/or H332.*
Specific target organ toxicity: single exposure and repeated exposure	STOT SE 1 STOT SE 2 STOT RE 1 STOT RE 2	H370 H371 H372 H373
Aspiration hazard	Asp. Tox. 1	H304
Airway or skin sensitising	Resp. Sens. 1, 1A or 1B Skin sens. 1, 1A or 1B	H334 H317

** Including all combinations of stated exposure routes and stated specific effect. For example, H350 also covers classification H350i.*

☒ Safety data sheet for the product that is compiled in accordance with current European legislation (Annex II to REACH, Regulation (EC) No 1907/2006).

☒ Appendix 2 for the product or equivalent certification duly completed and signed.

☒ If an exception is made for H302, H312 and/or H332: Documentation confirming the packaging is designed so that the user cannot come into contact with the product.

Background to requirement O3

Nordic Ecolabelling requires that the product must not have a classification as listed in Table 1 to ensure that products that are toxic or harmful to the environment and / or health cannot be Nordic Swan Ecolabelled.

Products whose packaging is designed so that the user cannot come into contact are exempted from the ban on the following classifications: H302, H312 and/or H332. These may, for example, be products that are packed in a container that is connected directly to an automatic dosing device or products that are pumped into the machine.

The requirement is changed compared with generation 2 of the criteria regarding the fact that classification with H314 is allowed.

4 Requirements concerning ingoing substances

O4 Classification of ingoing substances

The ingoing substances must not have a classification listed in Table 2.

Table 2 **Classification of ingoing substances**

CLP Regulation 1272/2008:		
Hazard	**Hazard class and category**	**Hazard code**
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351**
May cause genetic defects*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact.	H360 H361 H362
Respiratory or skin sensitising*	Resp. Sens. 1, 1A or 1B Skin sens. 1, 1A or 1B	H334 H317

** Including all combinations of stated exposure routes and stated specific effect. For example, H350 also covers classification H350i.*

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

**** Exemptions from the classification:*

- *Preservatives. Note that MI (methylisothiazolinone), CAS no. 2682-20-4 must not be present in the product according to requirement O8.*
- *Enzymes (including stabilisers in the enzyme raw material).*

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

✉ Appendix 2 for the product and Appendix 3 for all raw materials or equivalent certification duly completed and signed.

Background to requirement O4

Excluding CMR and sensitising substances is an important parameter from a health perspective. Complexing agents of the MGDA and GLDA type may contain NTA impurities in the raw material. NTA as an impurity in complexing agents is therefore exempted from the requirement, but with the restriction that the concentration must be less than 0.2% in the raw material and less than 0.1% in the end product which is best practice in the industry.

Preservatives and enzymes are exempted from the ban on being classified as H334 and H317. Preservatives are necessary to ensure the quality and shelf life of products with a neutral pH. Nordic Ecolabelling considers the benefits of preservatives to outweigh the risk of the user being exposed to the product and thus to sensitising preservatives.

Enzymes can improve the efficacy of products at low washing temperatures and thus reduce energy consumption. The use of enzymes is, however, relatively

uncommon in this product group, because the wash cycles are short and they need a certain amount of time to work.

Titanium dioxide: [in powder form containing 1 % or more of particles with aerodynamic diameter ≤ 10 µm] was classified as Carc. 2 by inhalation by the 14. ATP of CLP. In addition, the mandatory warning EUH212 was required on the packaging of solid mixtures containing 1 % or more of titanium dioxide. The mandatory EUH212 applied regardless of titanium dioxide particle size, implying that particles with aerodynamic diameter ≤ 10 µm may be released from any solid mixture containing titanium dioxide when used. These particles, "known to be released from ingoing substances" are counted as ingoing substances according to Nordic Ecolabelling's definition (cf. "General requirements" in the criteria document). Accordingly, all titanium dioxide occurring in solid mixtures (regardless of size) was prohibited. There has been a time limited exemption to this prohibition, which ran out in March 2025. In August 2025, the EU Court of Justice made a final decision to annul the Carc. 2 classification, meaning that titanium dioxide is no longer prohibited by this requirement. However, see requirement O8 where titanium dioxide as a nanomaterial is prohibited.

The requirement is unchanged compared with generation 2 of the criteria.

O5 Enzymes

Enzymes may only be present in the product in liquid form or as granulate capsules.

Enzymes in spray products must comply with safe limit for exposure. The exposure limit should be below the Derived No Effect Level, DNEL for consumers and professionals, 15 ng/m^3.*

* *Exposure measurements of enzymes for risk assessment of household cleaning spray products (AISE, July 2020).*

✉ Declaration from the enzyme manufacturer or information on safety data sheet/product data sheet.

✉ For enzyme-containing spray products: Risk assessment according to AISE:s "Exposure measurements of enzymes for risk assessment of household cleaning spray products (AISE, July 2020)".

Background to requirement O5

Enzymes may only be present in the product in liquid form or as granulate capsules, in order to reduce the risk of exposure to enzymes during manufacture of the product. For further risk assessments during production, see for example AISE's recommendations for the safe handling of enzymes[3].

Spray products with enzymes can be applied before washing (an alternative to soaking agents), thereby ensuring a more efficient wash with lower energy consumption. Enzymes can often also replace more environmentally problematic substances.

The use of spray will be able to create a cloud of aerosols that the user can breathe. Therefore, it must be ensured that sprays with enzymes are documented

[3] https://www.aise.eu/our-activities/standards-and-industry-guidelines/safe-handling-of-enzymes.aspx (accessed 14.01.2019).

through a risk assessment in accordance with "Exposure measurements of enzymes for risk assessment of household cleaning spray products (AISE, July 2020)". The upper exposure limit is set under "Derived No Effect Level" (DNEL). This means 15 ng / m^3.

The requirement has changed in relation to generation 2 of the criteria regarding the following:

- The term “granulated capsules” is now used instead of encapsulated granules. This is because the requirement will otherwise only be interpreted as the enzyme can be covered by polymer.
- Enzymes can now be added to spray products

O6 Surfactants

All surfactants must be:

a) Readily biodegradable according to test method no. 301 A–F in the OECD guidelines for testing of chemicals or other scientifically accepted testing methods if the test result is assessed by an independent body and verified by Nordic Ecolabelling.

b) Anaerobically biodegradable in accordance with ISO 11734, ECETOC No 28, OECD 311 or equivalent testing methods evaluated by an independent body and controlled by Nordic Ecolabelling.

✉ Reference to the DID list, version 2016 or later. For substances not on the DID list, or where data on the DID list is missing, the associated documentation must be submitted. See Appendix 4 for test methods and analysis laboratories.

Background to requirement O6

Surfactants are used primarily in rinse aids and soaking agents, but also occur in dishwasher detergents. Many surfactants are toxic to aquatic organisms. It is therefore important that all surfactants are biodegradable both under oxygen rich (aerobic) and oxygen poor (anaerobic) conditions.

The requirement is unchanged compared with generation 2 of the criteria.

O7 Water-soluble films

All water-soluble films (e.g., PVA films) for dishwasher detergents must be readily biodegradable according to test method No. 301 A–F or No 310 in OECD guidelines for testing of chemicals. Enhanced biodegradation[4] screening test performed as a modification of OECD 301B or OECD 301F with longer incubation and continued biodegradation measurements up to 60 days is accepted.

The test should be conducted on the total composition of the film. This can either be by testing on the actual water-soluble film or individually on each of the substances in the film.

Existing data for the biodegradability of individual substances and existing data for actual water-soluble films can be used to predict the biodegradation properties of another water-soluble film. This is accepted only if either of the following data is available:

[4] See ECHAs Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.7b: Endpoint specific guidance. Version 4.0. June 2017, page 213: https://echa.europa.eu/documents/10162/13632/information_requirements_r7b_en.pdf/1a551efc-bd6a-4d1f-b719-16e0d3a01919 (accessed on 2021-06-15).

a) When all the substances in the water-soluble film have been tested individually in a biodegradation test, and all the substances comply with the requirements to biodegradability in the criteria, then the water-soluble film can be considered to fulfil requirement O14. Data must be provided for all ingoing substances in the water-soluble film, that are present above 0.1 % in the water-soluble film.

OR

b) If two water-soluble films (film 1 and film 2) with a known composition of substances have been confirmed biodegradable according to the above-mentioned test guidelines, the same biodegradability can be assumed for a third product (film 3), if both of the following two conditions are met:
   - The concentrations of the substances in film 3 are within the concentration range covered by film 1 and film 2.
   - Any other substances in film 3, that are not present in film 1 and film 2, have been confirmed biodegradable according to the above-mentioned test guidelines.

✉ Test report(s) documenting the biodegradability of the film, conducted by a certified test laboratory according to Appendix 4.

Background to requirement O7

In the CLP Regulation water-soluble foil and film would be referred to as "soluble packaging". Nordic Ecolabelling however, considers it as part of the formulation as it is consumed along with the other raw materials during dishwashing.

Water-soluble films (e.g. poly vinyl alcohol, PVA) that encapsulate the dishwasher detergent are not considered microplastics according to the definition used in this criteria (see Prohibited Substances), as the definition is based on the term "insoluble". However, PVA is still a plastic and Nordic Ecolabelling would like to ensure that it is biodegradable in the aquatic environment.

The environmental fate of PVA depends on various factors, e.g. water solubility, composition and environmental condictions such as microbial populations. The water solubility of PVA is amongst others controlled by the degree of hydrolysis/metanolysis and polymer crystallinity. PVA is usually applied in blends with different polymeric or low molecular weight partners. Data from licensees and raw material suppliers shows a PVA content between 64-78%. Depending on the additives supporting or retarding effects on biodegradation must be expected.

A review from 2011 based on 68 scientific studies on identification and quantification of microplastics from the marine environment, found PVA in three studies[5]. A large-scale survey of microplastics in Mediterranean waters in 2016, identified sixteen different classes of synthetic materials. Here, PVA accounted for 1,2 % of the microplastics.

The OECD 301A-F guidelines are developed for the testing of single substances. In order to increase the flexibility for the applicants, we also accept enhanced biodegradability testing and read-across. Note: Inherent biodegradability testing is not accepted, as these provide favourable conditions for biodegradation, and are not suitable for identifying test items that can be considered to degrade

[5] Hidalgo-Ruz, V., Gutow, L., Thompson, R. C., & Thiel, M. (2012). Microplastics in the marine environment: a review of the methods used for identification and quantification. Environmental science & technology, 46(6), 3060–3075. https://doi.org/10.1021/es2031505.

rapidly in the environment. Read-across is only accepted within the exact frameworks that are specified in the criterion.

This is a new requirement.

O8 Substances prohibited from products

The following substances are excluded from use in products:

- Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD)
- Antimicrobial or disinfecting ingredients added for purposes other than preservation
- Benzalkonium chloride, CAS-no. 8001-54-5
- Borates and perborates
- DADMAC (dialkyldimethylammonium chloride), CAS-no. 68424-95-3
- DTPA (diethylenetriamine pentaacetate), CAS-no. 67-43-6
- EDTA (ethylenediaminetetraacetic acid), CAS-no. 13235-36-4, and its salts
- Phosphates
- Potential or identified endocrine disruptors according to any of the EU member state initiative ”Endocrine Disruptor Lists” List I; II; and III.
    - https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu
    - https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption
    - https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

  A substance which is transferred to one of the corresponding sublists called “Substances no longer on list”, and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sublist II which were evaluated under a regulation or directive which doesn’t have provisions for identifying EDs (e.g. the Cosmetics Regulation, etc.). For those substances, ED properties may still have been confirmed or suspected. Nordic Ecolabelling will evaluate the circumstances case-by-case, based on the background information indicated on sublist II.
- LAS (linear alkylbenzene sulphonates)
- MI (methylisothiazolinone), CAS no. 2682-20-4
- Microplastics

  Nordic Ecolabelling has updated the definition of microplastics by adopting the EU definition in the REACH restriction on synthetic polymer microparticles, which entered into force on 17 October 2023. Either the new or old definition shall be used.

  New definition: Microplastics are synthetic polymer microparticles as defined in REACH Regulation ((EC) No 1907/2006), Annex XVII, Entry no. 78: Synthetic polymer microparticles: polymers that are solid, and which fulfil both of the following conditions:

  a) are contained in particles and constitute at least 1% by weight of those particles; or build a continuous surface coating on particles.

b) at least 1% by weight of the particles referred to in point (a) fulfil either of the following conditions:

(i) all dimensions of the particles are equal to or less than 5 mm.

(ii) the length of the particles is equal to or less than 15 mm and their length to diameter ratio is greater than 3.

The following polymers are excluded from this designation:

a) polymers that are the result of a polymerisation process that has taken place in nature, independently of the process through which they have been extracted, which are not chemically modified substances.

b) polymers that are biodegradable as proved in accordance with Appendix 15 [to REACH, Regulation (EC) No 1907/2006].

c) polymers that have a solubility greater than 2 g/L as proved in accordance with Appendix 16 [to REACH, Regulation (EC) No 1907/2006].

d) polymers that do not contain carbon atoms in their chemical structure.

N.B. The following "Conditions of restriction" paragraphs apply: 1 (concentration limit in mixtures), 2 (definitions), 3 (particle size limits). The remaining points do not apply, e.g. 4 (Paragraph 1 shall not apply to the placing on the market of:), e.g. 4(a) "synthetic polymer microparticles, as substances on their own or in mixtures, for use at industrial sites", 5 (derogations), e.g. 5 (b) "synthetic polymer microparticles the physical properties of which are permanently modified during intended end use in such a way that the polymer no longer falls within the scope of this entry".

Old definition: Microplastics are defined here as particles of insoluble macromolecular plastic less than 5 mm in size, achieved through one of the following processes:

a) Polymerisation, such as polyaddition or polycondensation, or a similar process that uses monomers or other precursors.

b) Chemical change of natural or synthetic macromolecules.

c) Microbial fermentation.

Note that Nordic Ecolabelling follows the development of ECHA's restriction proposal and its definition, and we reserve the right to change the definition above once the definition in the restriction proposal has been fixed. An appropriate transition period will be granted.

- Nanomaterials/particles

  Nanomaterials are defined in accordance with the European Commission's definition of nanomaterials (2011/696/EU): "a natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50% or more of the particles in the number size distribution, one or more external dimensions is in the size range 1–100 nm." Examples include ZnO, TiO_2, SiO_2 and Ag. Polymer emulsions are not considered to be a nanomaterial.

- NTA (nitrilotriacetic acid), CAS-no. 139-13-9 and its salts

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

- Organic chlorine compounds and hypochlorites

  Exception: Preservatives may contain organic chlorine compounds.
- Fragrances
- PFAS (per- and polyfluoroalkyl substances)
- Substances that have been judged in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative), in accordance with the criteria in Annex XIII of REACH, plus substances that have not yet been investigated but that meet these criteria.
- Substances categorised as Substances of Very High Concern (SVHC) and included on the Candidate List: https://echa.europa.eu/candidate-list-table.

✉ Appendix 2 for the product and Appendix 3 for all raw materials or equivalent certification duly completed and signed.

Background to requirement O8

This requirement generally prohibits substances that Nordic Ecolabelling knows or suspects have negative effects on health and the environment – but that are not covered by other requirements. Some of the substances are also prohibited in other requirements but are included here for the sake of clarity and to minimise the risk of misunderstandings.

APEO and APD

Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD) are a group of non-readily biodegradable surfactants that are proven endocrine disruptors. The substances have been phased out of most products through legislation. APEO and APD are also excluded from use through requirement O6.

Antimicrobial or disinfecting ingredients added for purposes other than preservation

Antimicrobial or disinfecting ingredients (for purposes other than preservation) are generally undesirable because chemical disinfection is not required for dishwasher detergents. Due to the way they work, substances with disinfecting or antimicrobial properties tend to have high aquatic toxicity and are often not readily biodegradable due to their inhibiting effects on bacteria. The use of antimicrobial and disinfecting ingredients should therefore be reduced generally, in view of the potential for resistant bacteria to develop.

Benzalkonium chloride

Benzalkonium chloride is classified H302, H312, H314 and H400. The following description is also provided by ECHA: "According to the EU harmonized classification and labelling (CLP00) approved, this substance causes serious skin

burns and eye damage, is highly toxic to aquatic organisms, is harmful if swallowed and is harmful by skin contact".[6]

Benzalkonium chloride is also associated with bacterial resistance.[7]

Borates and perborates

Perborates are sometimes used as bleaching agents. Many perborates are classified as toxic for reproduction. Nordic Ecolabelling wishes to continue listing these as prohibited, despite them also being banned under requirement O5.

DADMAC (dialkyldimethylammonium chloride)

DADMAC (dialkyldimethylammonium chloride) encompasses a group of cationic surfactants with very high ecotoxicity, slow aerobic biodegradability and no anaerobic biodegradability (there is little data on this), which is why DADMAC is undesirable. DADMAC is excluded under the surfactant requirement but may be defined as something other than a surfactant and is prohibited here to simplify the administrative process.

EDTA (ethylenediaminetetraacetic acid and its salts) and DTPA (diethylenetriamine pentaacetate)

EDTA (ethylenediaminetetraacetic acid and its salts) is not readily biodegradable, and the EU's risk assessment states that under the conditions at municipal water treatment plants EDTA is either not broken down or only breaks down to a slight degree.[8] Today there are more environmentally aware alternatives that are degradable and that can replace EDTA, one example being MGDA (methyl glycine diacetic acid). EDTA is used as a complexing agent in many chemical-technical products. DTPA has similar characteristics to EDTA.

Phosphates

Plants, animals and people all depend on phosphorus to grow. Phosphorus (a constituent element of phosphates) is, amongst other things, an essential ingredient in artificial fertiliser, which in turn is fundamental in making it possible to feed over 7 billion people on the planet. The problem is that phosphorus is a non-renewable resource, facing ever-increasing demand, that can only be extracted from phosphorite, and this is only found in a few countries, several of which have unstable regimes. Apart from Morocco, many of these countries are already beginning to run out of extractable phosphorus.[9] Since there are alternatives, Nordic Ecolabelling has chosen to prohibit the use of phosphates.

Phosphate refers to salts of phosphoric acid.

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[6] https://www.echa.europa.eu/da/web/guest/substance-information/-/substanceinfo/100.058.301 (accessed on August 5, 2021)
[7] Mulder, I. m.fl: Quaternary ammonium compounds in soil: implications for antibiotic resistance development (2017)
[8] European Union (2004). Risk Assessment Tetrasodium Ethylenediaminetetraacetate, Final Report. https://echa.europa.eu/documents/10162/415c121b-12cd-40a2-bd56-812c57c303ce (Accessed on 11.09.2020).
[9] https://www.dn.no/forskning/natur/matproduksjon/miljo/nar-det-er-tomt-her-er-verden-ille-ute/1-1-5757310 (Accessed on 03.12.2020)

Endocrine disruptors

Endocrine disruptors (EDs) are chemicals that alter the functioning of the endocrine (hormone) system and consequently cause adverse health effects. The term potential EDs is used for chemicals with properties that make them suspected to be EDs. The hormone system regulates many vital processes in living organisms and when normal signalling is disturbed, adverse effects may result. EDs raise high concern for their risk of causing serious negative impact on the environment as well as on human health specifically. Special concern is raised for effects on reproduction and development and about possible links to increases in public health diseases. While effects in wildlife populations have been confirmed, evidence is pointing to effects also in humans.

Currently, endocrine disrupting properties is not a hazard that is classified according to the CLP regulation. Also, harmonised scientific criteria for the identification of EDs are missing across different pieces of EU legislation. Few EDs have been identified in the legislation so far, compared to the numbers of potential EDs. Under these circumstances, the Nordic Swan Ecolabel excludes identified and potential EDs listed by the EU member state initiative "Endocrine Disruptor Lists" at www.edlists.org. The initiative is a voluntary collaboration, compiling and presenting a single repository of information about the current status of substances identified as EDs or being under ED evaluation in the EU.

A substance listed on any of List I; II; and/or III is excluded. List I contains substances identified as EDs at EU legislative level; List II contains substances under EU legislative ED evaluation; and List III is for substances considered by a national authority to have ED properties. All listed substances are excluded from all raw materials and products unless otherwise specified in the requirement, meaning that substances listed with reference to e.g. the Cosmetics Regulation are not only excluded from cosmetics.

The requirement concerns the main lists (List I-III) and not the corresponding sublists called "Substances no longer on list". A substance which is transferred to a sublist is thus no longer excluded, unless it also appears on any of the other main lists I-III. However, special attention is needed concerning those List II substances which are evaluated under a regulation or directive which doesn't have provisions for identifying EDs, e.g. the Cosmetics Regulation. Since it's not within the scope of e.g. this regulation to identify EDs, it's not clear how the substances will be handled at www.edlists.org once the evaluation (safety assessment of the substances in cosmetics in this case) is finalised. Nordic Ecolabelling will evaluate the circumstances for substances on sublist II case-by-case, based on the background information indicated on the sublist.

The lists are dynamic and the companies are responsible for keeping track of updates, in order to keep labelled products compliant with the requirement throughout the validity of the licences. Nordic Ecolabelling acknowledges the challenges associated with new substances being introduced on particularly List II and III, and in some cases also List I. We will evaluate the circumstances and possibly decide on a transition period on a case-by-case basis.

By excluding both identified and prioritised potential EDs which are under evaluation, the Nordic Swan Ecolabel ensures a restrictive policy on EDs.

LAS (Linear alkylbenzene sulphonates)

Linear alkylbenzene sulphonates (LAS) are toxic to aquatic organisms and are not biodegradable in an anaerobic environment. LAS are excluded from use in requirement O6, but are also included in the list of substances that must not be present in Nordic Swan Ecolabelled dishwasher detergent for professional use, in order to clarify that LAS are undesirable substances.

MI (methylisothiazolinone)

Allergies to preservatives, particularly MI (CAS no. 2682-20-4) have risen in recent years and Nordic Ecolabelling does not want to contribute towards unnecessary exposure.

Microplastics

Microplastics[10] are very small fragments of plastic material, less than 5 mm. They can be harmful to health and the environment due to their size, surface properties, resistance to degradation and because they can carry harmful chemicals. In nature, microplastics come from pellets, paint, tires, textiles, personal care products and various plastic items. They have been found all over the world, at sea, in freshwater, sediments, sludge from wastewater treatment plants and agricultural soil. Microplastics have been detected in various aquatic organisms across the food chain, from zooplankton to vertebrates and in human tissues and organs such as blood and placenta. The Nordic Swan Ecolabel uses the precautionary principle and strives to limit the use and release of microplastics wherever possible.

In the first version of this criteria generation, Nordic Ecolabelling opted to use the EU Ecolabel's definition (the 'old' definition) of microplastics, since the definition used in the ECHA's proposal for a restriction on the use of intentionally added microplastics (the 'new' definition) was still under development. This newer definition was adopted under REACH by the EU Commission in September 2023. Nordic Ecolabelling has decided to include both definitions in the criteria. Applicants and raw material suppliers may choose to declare according to either definition.

Nanomaterials and nanoparticles

Nanoparticles are also prohibited. The greatest cause for concern is the use of nanoparticles that can be released and thereby affect health and the environment. There is concern among public authorities, environmental organisations and others about the lack of knowledge regarding the potential detrimental effects on health and the environment.

NTA (nitrilotriacetic acid) and its salts

NTA is classified as Carc cat. 2 (EU, 2008b) and is thus already prohibited in requirement O4 due to its classification. However, complexing agents that replace NTA (GLDA and MGDA) contain small quantities of NTA as residues from raw material production (as attested in various safety data sheets for the raw materials). To encourage a transition to MGDA and GLDA, they may contain

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

NTA impurities in the raw material in concentrations of less than 0.2%, if the concentration of NTA in the product is below 0.1%.

Organic chlorine compounds and hypochlorites

Sodium hypochlorite or organic chlorine compounds are sometimes used as disinfecting and antibacterial substances and as bleaching agents. Organic chlorine compounds can be, or lead to the formation of, toxic and bioaccumulative substances that are difficult to break down. Chlorine-based bleaching agents generally have undesirable health and environmental properties. Reactive chlorine compounds such as hypochlorites are toxic but break down quickly. Hypochlorites have the classification Acute toxicity (H 400) and will thus not be covered by the general requirement concerning environmentally hazardous substances. Sodium hypochlorite may pose an environmental risk due to the possibility of organic chlorine compounds forming.

Fragrances

Fragrances can be toxic to aquatic life, non-readily biodegradable, bioaccumulative and sensitising. They fulfil no function in dishwasher detergents for professional use and therefore are not permitted.

Per- and polyfluoroalkyl substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS) constitute a group of substances that have harmful properties. Certain per- and polyfluorinated compounds can be broken down into the very stable PFOS (perfluorooctane sulphonate) and PFOA (perfluorooctanoic acid) and similar substances. These substances are found all over the globe, from the large oceans to the Arctic. PFOS have also been found in birds and fish and in their eggs. The substances are extremely persistent and are easily absorbed by the body.[11] The substances in this group impact on the biological processes of the body and are suspected to be endocrine disruptors, carcinogenic and to have a negative impact on the human immune system.[12] PFOA, APFO (ammonium pentadecene fluoro octanoate) and certain fluoro acids are on the Candidate List due to their reprotoxicity, as well as PBT. There are new research results showing that shorter chains (2–6 carbon atoms) have been discovered in nature.[13] To ensure that these PFAS are not introduced in dishwasher detergents or rinse aids, Nordic Ecolabelling has chosen to place PFAS on the list of prohibited substances.

[11] Borg, D., Tissue Distribution Studies And Risk Assessment Of Perfluoroalkylated And Polyfluoroalkylated Substances (PFASS), Doctoral thesis, Institute Of Environmental Medicine (IMM) Karolinska Institutet, Stockholm, Sweden 2013 http://publications.ki.se/xmlui/bitstream/handle/10616/41507/Thesis_Daniel_Borg.pdf?sequence=1

[12] For example, Heilmann, C. et al, Persistente fluorbindelser reducerer immunfunktionen, Ugeskr Læger 177/7, 30.3.2015 OSPAR 2005: Hazardous Substances Series, Perfluorooctane Sulphonate (PFOS), OSPAR Commission, 2005 (2006 Update), MST, 2005b: Environmental project no. 1013, 2005, More Environmentally Friendly Alternatives to PFOS-compounds and PFOA, Danish Environmental Protection Agency, 2005.

[13] Perkola, Noora, Fate of artificial sweeteners and perfluoroalkyl acids in aquatic environment, Doctoral dissertation Department of Environmental Sciences, Faculty of Biological and Environmental Sciences, University of Helsinki, Finland 12.12.2014, https://helda.helsinki.fi/bitstream/handle/10138/136494/fateofar.pdf?sequence=1

Substances that have been judged in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative)

PBT (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative) are organic substances as defined in Annex XIII to REACH (Directive 1907/2006/EC).[14] Nordic Ecolabelling generally does not want these substances to be used.

Most PBT and vPvB substances are automatically excluded from dishwasher detergents for professional use based on the restrictions concerning environmentally hazardous substances, but not all of them.

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

Candidate List and SVHC, Substances of Very High Concern

SVHC, Substances of Very High Concern, is a term to describe the substances which fulfil the criteria in article 57 of the REACH Regulation. These are substances which are CMR (categories 1A and 1B in accordance with the CLP Regulation), PBT substances, vPvB substances (see the section below) and substances which are endocrine disruptors or environmentally hazardous without fulfilling the requirements for PBT or vPvB. SVHC can be included on the Candidate List with a view to subsequent inclusion in the Approval List. This means that the substance is subject to regulation (prohibition, phasing-out or other type of restriction). Due to these undesirable properties, substances on the Candidate List cannot be Nordic Swan Ecolabelled. Other SVHC substances are addressed via bans on the use of PBT and vPvB substances, plus classification requirements and a ban on endocrine disruptors.

The requirement has been changed with generation 2 of the criteria in terms of the following:

- “Reactive chlorine compounds” has been changed to “Organic chlorine compounds and hypochlorites”
- New substances on the list: Antimicrobial or disinfecting ingredients added for purposes other than preservation, Benzalkonium chloride, DTPA (diethylenetriamine pentaacetate), phosphates, PFAS, MI (methylisothiazolinone), microplastics and substances categorised as Substances of Very High Concern (SVHC).
- The definition of endocrine disruptors has been updated.

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

5 Certified raw materials

O9 Certified raw materials from oil palms

Palm oil, palm kernel oil and derivatives of palm oil or palm kernel oil must have RSPO certification. The approved traceability systems are Mass Balance, Segregated or Identity Preserved.

The requirement does not apply to raw materials that make up less than 1% of the product.

- ✉ Declaration from the raw material producer that no palm oil, palm kernel oil or palm oil/palm kernel oil derivatives are present in the raw material. Appendix 3 can be used.
- ✉ A valid RSPO Supply Chain certificate from the raw material's producer or supplier.
- ✉ Invoices or delivery notes from the raw material supplier showing with which traceability system the purchased palm oil is certified (Mass Balance, Segregated and Identity Preserved are accepted).

Background to requirement O9

Special attention is paid to palm oil which raises concerns on e.g. land use. The primary approach of Nordic Ecolabelling is prohibition of palm oil. If prohibition is not feasible, the secondary approach to reduce the negative effects of palm oil products is to require certified palm oil.

Palm oil is difficult to avoid completely in dishwasher detergents. Many surfactants are based on palm oil and palm kernel oil derivatives, and surfactants based on synthetic and natural sources are not always directly interchangeable.

The cut off limit of 1.0% is set to reduce the burden of documentation and focus on the raw materials that are present at higher percentages.

This is a new requirement.

6 Dosing, ecotoxicity and biodegradability

The requirements in this chapter are based on the highest recommended dosing stated on the product label or accompanying product sheet, regardless of water hardness and degree of soiling.

O10 Maximum dosing

The product may have a maximum dosage according to Table 3.

Table 3 **Maxium dosing**

Product type	Maximum dosing
Dishwasher detergents	4 grams / litre water
Soaking agents	50 grams / litre water
Products used to clean instruments in healthcare	8 grams / litre water
Rinse aids	2 grams / litre water
Dishwasher detergents for aluminium goods	4 grams / litre water

✉ Copy of label and/or product sheet stating the recommended dosing.

Background to requirement O10

The best way to avoid very diluted products (which generate unnecessary transport of water) is to set a maximum limit for the dosing of the products. The requirement level has been set on the basis of licence data and consultation comments. The limits ensure that products continue to be provided in concentrated form.

The requirement is new for this generation of the criteria.

O11 Long-term environmental effects

The product's content of substances which are classified* with hazard code H410, H411 or H412 is limited as follows:

$100*C_{H410} + 10*C_{H411} + C_{H412} \leq 0.40$ grams / litre water, where

C_{H410} = concentration of substances with H410 in grams / litre of water

C_{H411} = concentration of substances with H411 in grams / litre of water

C_{H412} = concentration of substances with H412 in grams / litre of water

The calculation must be based on the highest recommended dosing stated on the product label or accompanying product sheet, regardless of water hardness and degree of soiling.

Surfactants classified as H411 and H412 are exempted from the requirement on the condition that they are readily biodegradable** and anaerobically biodegradable***.

Subtilisin classified as Aquatic Chronic 2 (H411) is exempt from the requirement.

Hydrogen peroxide classified with H412 is exempted from the requirement.

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

** Note that in order to assess the classification, all the available data must have been evaluated, including data in ECHA databases.*

*** In accordance with the DID list, version 2016 or later. If the substance is not on the DID list, or data on the DID list is lacking, document in accordance with test method no. 301 A–F in the OECD guidelines for testing of chemicals or other scientifically accepted testing methods if the test result is assessed by an independent body and verified by Nordic Ecolabelling.*

**** In accordance with the DID list, version 2016 or later. If the substance is not on the DID list, or data on the DID list is lacking, document at least 60% degradability under anaerobic conditions in accordance with ISO 11734, ECOTOC no. 28, OECD 311 or other scientifically accepted testing methods if the test result is assessed by an independent body and verified by Nordic Ecolabelling.*

- ✉ Calculation of the product's content of substances which are classified with hazard code H410, H411 or H412. Nordic Ecolabelling's calculation sheet must be used. It is available from Nordic Ecolabelling's websites.
- ✉ Appendix 2 for the product and Appendix 3 for all raw materials or equivalent certification duly completed and signed.
- ✉ Report on surfactants that are to be exempted from the requirement (quantity, classification, biodegradability).

Background to requirement O11

A Nordic Swan Ecolabelled product must not be classified as environmentally hazardous, see requirement O3. To further minimise potential problems for the aquatic environment, a limit has been set for the highest permitted content of environmentally hazardous substances in a product. The set threshold values are based on licence data.

Nordic Ecolabelling continues to exempt aerobically and anaerobically biodegradable surfactants classified as H412 from the requirement. It has been decided to grant the same exemption to H411-classified surfactants as to H412-classified ones. Introducing this additional exemption will not give rise to the certification of more toxic formulations than the ones already approved today. The requirement "Classification of the product" will restrict the amount of H411 and H412 classified surfactants to 2,5% and 25%, respectively. In addition, the "Critical dilution volume"-requirement will restrict the content of highly aquatic toxic surfactants. Protease (subtilisin, EINECS 232-752-2, CAS no. 9014-01-1) effectively breaks down protein-based soiling and cannot be replaced with other enzymes. Protease is classified as Aquatic Chronic 2 (H411), although it is readily biodegradable.

Hydrogen peroxide (CAS No. 7722-84-1) is released from sodium percarbonate and effectively breaks down bleachable stains. It is important in many powder products. Hydrogen peroxide is classified as Aquatic Chronic 3 (H412) even though it is rapidly degraded in the environment.

The requirement has been changed compared with generation 2 of the criteria regarding excluding hydrogen peroxide from the calculation.

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

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

• The M-factors for H410-classified substances must be included in the calculation.

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

O12 CDV

The product's critical dilution volume (CDV) must not exceed the maximum values stated in Table 4.

Table 4 **CDV threshold value**

Product type	$CDV_{chronic}$
Dishwasher detergents	1800 litres / litre water
Soaking agents	1800 litres / litre water
Products used to clean instruments in healthcare	3000 litres / litre water
Rinse aids	3000 litres / litre water
Dishwasher detergents for aluminium goods	3000 litres / litre water

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

$CDV_{chronic} = \sum CDV_i = \sum (dose_i \times DF_i \times 1000 / TF_{i\ chronic})$, where

$dose_i$ = the constituent volume of each individual substance "i", in grams/litre of working solution

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

$TF_{i\ chronic}$ = chronic toxicity factor for substance "i", in accordance with the DID list

If $TF_{i\ chronic}$ is lacking, $TF_{i\ acute}$ can be used.

The calculation must be based on the highest recommended dosing stated on the product label or accompanying product sheet, regardless of water hardness and degree of soiling.

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

☒ Calculation of product's $CDV_{chronic}$. Nordic Ecolabelling's calculation sheet must be used. It is available from Nordic Ecolabelling's websites.

☒ Appendix 3 for all raw materials or equivalent certification duly completed and signed.

Background to requirement O12

CDV is a theoretical value that takes account of each substance's toxicity and biodegradability in the environment. The method was developed together with the EU Ecolabel. Setting a maximum limit for CDV ensures that the Nordic Swan Ecolabelled products have a minimal impact on the receiving water. CDV is calculated for all ingoing substances in the product.

The CDV limit is only stated with chronic values in generation 3. The use of chronic data is generally preferable, since long-term toxicity data is considered of higher quality and to give more precise/reliable estimates of potential environmental effects compared with acute toxicity data. The threshold values have been set based on licence data.

Products used for instrument cleaning in healthcare are themselves defined as class I medical equipment with associated CE marking and are subject to strict regulations. It is essential that the quality of such products is high and consistent. pH-neutral products are susceptible to microbiological contamination.

Due to the strict and costly Biocidal Products Regulation, the number of available preservatives is small and shrinking. Since they are biocides (designed to kill), out of necessity those that are available have properties and toxicity values that may give an increased CDV value. The threshold value has therefore been set slightly higher for this category.

The requirement has been changed with generation 2 of the criteria in terms of the following:

- Products used to clean instruments in healthcare and dishwasher detergents for aluminium goods are separate product types.
- Only chronic values are given for the CDV limit.
- The threshold values have been tightened up.

O13 Biodegradability – aerobic and anaerobic (aNBO and anNBO)

The product's total content of organic substances that are either not aerobically or anaerobically biodegradable must not exceed the threshold values stated in Table 5.

Table 5 **Threshold values for aNBO and anNBO**

Product type	aNBO	anNBO
Dishwasher detergents	0,15 g / litre water	0,20 g / litre water
Soaking agents	0,15 g / litre water	0,20 g / litre water
Products used to clean instruments in healthcare	0,15 g / litre water	0,20 g / litre water
Rinse aids	0,040 g / litre water	0,040 g / litre water
Dishwasher detergents for aluminium goods	0,15 g / litre water	0,20 g / litre water

The calculation must be based on the highest recommended dosing stated on the product label or accompanying product sheet, regardless of water hardness and degree of soiling.

Iminodisuccinate (DID No. 2555) and cumene sulfonates (DID No. 2540) are excluded from the calculation of anNBO.

Polycarboxylates (DID No. 2507 and 2508) are excluded from the calculation of aNBO and anNBO.

Note that all surfactants must be aerobically and anaerobically biodegradable under requirement O6.

See also the exemption from the requirement of anaerobic biodegradability for substances which are not surfactants (Appendix 4, item 6, Anaerobic biodegradability).

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

✉ Calculation of the product's content of organic substances that are either not aerobically or anaerobically biodegradable. Nordic Ecolabelling's calculation sheet must be used. It is available from Nordic Ecolabelling's websites.

Background to requirement O13

The requirement cuts the amount of non-biodegradable substances in dishwasher detergents for professional use to a minimal level. This reduces the potential

accumulation of non-readily biodegradable substances in waste sludge and in other relevant pockets in the environment.

Iminodisuccinate and cumene sulfonates are excluded from the calculation of anNBO. Iminodisuccinate is used as a complexing agent and can be an alternative to phosphate. Cumenesulfonates meet the conditions for exemption according to section 7 of Annex 4 but are included in the requirement as a clarification.

Phosphate is prohibited in the criteria and for alternative complexing agents to be effective, polycarboxylates need to be added. As these make a significant contribution to both aNBO and anNBO, Nordic Ecolabelling has chosen to exclude them from the calculation instead of raising the limit values.

The limit values are stricter for all product types except rinse aids in comparison to generation 2 of the criteria. In addition, polycarboxylates are excluded from the calculation.

O14 Phosphonates/phosphonic acids

The product's content of phosphonates/phosphonic acids must not exceed the maximum values stated in Table 6.

Table 6 **Threshold values for content of phosphonates/phosphonic acids**

Product type	Phosphonates/phosphonic acids
Dishwasher detergents	0,01 g / litre water
Soaking agents	0,01 g / litre water
Products used to clean instruments in healthcare	0,01 g / litre water
Rinse aids	0,006 g / litre water
Dishwasher detergents for aluminium goods	0,01 g / litre water

The calculation must be based on the highest recommended dosing stated on the product label or accompanying product sheet, regardless of water hardness and degree of soiling.

✉ Calculation of the product's content of phosphonates/phosphonic acids. Nordic Ecolabelling's calculation sheet must be used. It is available from Nordic Ecolabelling's websites.

Background to requirement O14

Phosphonates can increase the mobility of heavy metals in water treatment plants and in nature. They also biodegrade very slowly, which means that they can affect the environment for a long time. On the other hand, it only takes a small amount of phosphonate to stabilise bleaching agents that are a good alternative to hypochlorite. Nordic Ecolabelling have therefore chosen to permit the use of phosphonates and phosphonic acids, but only in extremely small quantities.

The requirement is unchanged from generation 2 of the criteria.

7 Packaging and user information

Nordic Ecolabelling sets strict requirements on packaging to ensure good possibilities for material recovery and circular economy.

The packaging requirements target the primary packaging* (e.g. container, closure, label). Only the packaging types described in requirement O15-O18 can currently be used. Bag-in-box packaging must meet the requirements for flexible plastic bags (O17) and rigid plastic packaging (O15) or paper-based packaging (O18) depending on the material of the box. If you are interested in another packaging type, please contact Nordic Ecolabelling to find out whether the criteria can be extended to include your format.

Note: Any component of the product that enters the dishwasher machine and eventually goes down the drain, is considered as part of the formulation/recipe (eg. water-soluble film, print on film etc.).

** In accordance with EU Directive 94/62/EC on packaging and packaging waste, the term "primary packaging" is defined as consumer packaging, i.e. packaging conceived so as to constitute a sales unit to the final user or consumer at the point of sale.*

O15 Rigid plastic packaging: Design for recycling

Primary packaging smaller than 200 litres must have a design that enables material recovery.

Container means bottle, box, can etc.

Closure means cap, lid, pump, spout, oblate, seal, membrane etc.

Label means "traditional label", shrink film label/sleeve, direct print etc. (see O16 for details on label requirements).

- The packaging must contain at least 90% plastic (polyethylene (PE), polypropylene (PP) or polyethylene terephthalate (PET)).
- The individual components of the container and closure must be made from monomaterial* of either polyethylene (PE), polypropylene (PP) or polyethylene terephthalate (PET).

  Exemption:

  Colored PP packaging components may have up to 5% PE if they come from the masterbatch.

  Membranes, oblates and seals may be made of expanded polyethylene (EPE), expanded polypropylene (EPP), thermoplastic elastomer (TPE) based on styrene-ethylene-butylene-styrene thermoplastic elastomer (SEBS), aluminium, paper and plastic of non-monomaterial (but it must be PE, PP and / or PET).
- It is not allowed to add pigments to PET.

  Exemptions:

  - *Coloured, recycled PET-granulate where the pigment originates from the recycled material is allowed.*
  - *Pigments that are added to UV blockers and that do not make up more than 10 ppm of the container.*
- Carbon black pigments must not be added to container or closure.

- Fillers (such as $CaCO_3$) must not be included in PE or PP containers or closures at a level that the density of the plastic exceeds 0.995g / cm^3.
- Barriers are not allowed in plastic packaging.
- Metal must not be part of the container or closure.

  Exemptions:
  - *Metal springs.*
  - *Metal mesh in lids.*
- Silicone is not allowed in closures.

  Exemption: Lubricant in spray bottle triggers.

** Recycled plastic, which is purchased as a type of polymer, e.g. PP, considered monomaterial.*

✉ Packaging specifications (including all components as container and closure, label etc.) or certificate showing the materials used, component weights, density of PE or PP components, whether components contain PCR material and which pigments have been added. Appendix 5 can be used as part of the documentation.

Background to requirement O15

The waste stage is influenced by many factors, such as sorting opportunities in each country or municipality, and how the consumer ultimately sorts waste. Nordic Ecolabelling can, however, generally work for the recycling of packaging and set requirements intended to support this process.

The EU has adopted a circular economy action plan[15] that has a clear focus on recovery and recycling, particularly with regards to packaging material. EU has also accepted a plastic strategy[16] focusing on making recycling of plastics more profitable, reduce the use of single use plastic products, stop the littering of oceans, push investments and innovations regarding minimization of waste and work toward global solutions and standards to reduce the amounts of plastic used.

Recyclability is an important step in shifting towards circular economy. The requirements on design for recycling ensure that packaging is recyclable in today's recirculation systems in the Nordic countries.

The Nordic recycling manuals for plastic packaging[17] are the base for the requirement stating that plastic bottles/containers and closures must be made

[15] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Closing the loop – An EU action plan for the Circular Economy, COM(2015) 614 final, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614
[16] EU, Plastic Waste: a European strategy to protect the planet, defend our citizens and empower our industries, 2018, http://europa.eu/rapid/press-release_IP-18-5_en.htm (visited 2018-01-24)
[17] "Plastförpackningar – En återvinningsmanual från FTI, version 0.7,
Suomen Uusiomuovi Oy: Opas kierrätyskelpoisen muovipakkauksen suunnitteluun
http://www.uusiomuovi.fi/document.php/1/130/packdes_painos_1/442070829017fd4aa7d7e00bf960978b (visited 2019-04-30)

from PE, PP or PET. These are the best plastics from a recycling perspective. Biodegradable plastics are not suitable in today's recycling systems and can cause problems in the material recovery process.

Membranes, oblates and seals are used because closures need to be tight in all handling, from transport to use by the customer. This is especially important when dealing with corrosive chemicals such as dishwasher detergents. Many conveyors use automatic machine sorting where packages are handled very harshly. Therefore, membranes, oblates and seals may be made of expanded polyethylene (EPE), expanded polypropylene (EPP), thermoplastic elastomer (TPE) based on styrene-ethylene-butylene-styrene thermoplastic elastomer (SEBS), aluminium, paper and plastic of non-monomaterial (but it must be PE, PP and / or PET).

Colourless plastics have the highest recovery value. Dark colours result in darker recycled fraction, which is not preferable. In addition, carbon black cause problems in automated sorting plants, as the NIR (near infrared reflectance) detector cannot identify dark colours produced with carbon black.

For virgin PET, pigments are not accepted since there is no market for coloured PET packagings and coloured packagings are currently burned in Nordic recycling systems.

Fillers are restricted so that the HDPE or PP density does not exceed 0.995 g / cm^3. If the plastic becomes too dense, it sinks in the water bath in the recycling process and goes to incineration instead of material recovery.

Metal is not allowed because residues cause plastics to be rejected if there are metal detectors on the sorting line. Metal residues can also break down plastics and become a problem in recycled plastic production[18, 19]. Metal springs are exempt from the ban. A metal spring is needed to ensure that the package is resealed when removed from the holder after use. A plastic spring loses the ability to spring back after a while, which can result in the user coming into contact with corrosive product residues due to. that the packaging is not resealed. Metal nets in lids are also exempt from the ban. A metal mesh can be made more fine-meshed than a plastic mesh, which gives a larger contact surface, means that less water is required to dissolve the product and leads to a lower product consumption.

Silicone is not allowed in packaging as it is difficult to remove in recycling process and silicone impurities in the recycled fraction are problematic.

The requirement is new compared with generation 2 of the criteria.

https://plast.dk/wp-content/uploads/2018/11/Design-manual-ENG-Forum-for-Circular-Plastic-Packaging-NOVEMBER-2018.pdf, https://plast.dk/wp-content/uploads/2018/06/Bilag-A-designmanual.pdf; https://www.grontpunkt.no/media/2777/report-gpn-design-for-recycling-0704174.pdf (Accessed 2020-08-12);
http://norden.diva-portal.org/smash/get/diva2:1364632/FULLTEXT01.pdf (Accessed 2020-08-12);

[18] Plastkretsen and FTI, Bättre förutsättningar för återvinning av plastförpackningar.
[19] http://www.plasticsrecycling.org/hdpe (Accessed 2017-08-08)

O16 Labels for rigid plastic packaging: Design for recycling

Labels on packages smaller than 200 litres must have a design that enables material recovery.

Label means "traditional label", shrink film label/sleeve, direct print etc.

- Containers in polyethene (PE) and polypropene (PP): The following label materials are permitted:
  - Polyolefin plastic labels (PE and PP) as well as PET or PET-G labels with density > 1.0 g/cm^3. For labels of different material than the packaging, the suitability must be substantiated in accordance with Recyclass' Washing quick test procedure. For film labels applied on HDPE & PP containers, version 1.0[20].
  - Paper labels without fibre loss. The suitability must be substantiated in accordance with Recyclass' Washing quick test procedure: For paper labels applied on HDPE & PP containers, standard laboratory practice, version 1.021.
- Containers in polyethylene terephthalate (PET) must have a label of a different plastic material, with a density < 1.0 g/cm^3, or a paper label without fibre loss.
  - Paper labels without fibre loss: The suitability must be substantiated in accordance with Recyclass' Washing quick test procedure: For paper labels applied on HDPE & PP containers, standard laboratory practice, version 1.022, 21.

  Note: PET-G is not allowed in labels on PET containers. For the time being, cPET labels are also not permitted. Nordic Ecolabelling will consider allowing cPET-labels with the appropriate specifications, if cPET labels become endorsed by EPBP (The European PET Bottle Platform) for PET bottles and/or by RecyClass (www.recyclass.eu).
- Polyvinyl chloride (PVC) and other halogenated plastics must not be used in labels.
- Metallized labels/shrink film labels are not permitted.

  Exception: Metal foil in RFID labels.
- For labels of different material than the packaging: Labels must not cover more than 60% of the container. The calculation of the percentage shall be based on the two-dimensional profile of the container i.e., the area of the top and bottom of the packaging and the sides of a box/ container/bottle/can shall not be included in the calculation. If the label on the front of pack and back of pack are of different size, the maximum percentage of 60% shall be fulfilled for each side separately. For a cylindrical bottle, the calculation can also be based on the three-dimensional profile exclusive bottom and top of the bottle.
- Direct print on the container is not permitted except for date codes, batch codes and UFI (Unique Formula Identifier).

✉ Label specifications showing the material used and density. Appendix 5 can be used as part of the documentation.

[20] https://recyclass.eu/wp-content/uploads/2021/05/RecyClass-Washing-QT-Procedure-for-Film-Labels-applied-on-HDPE-and-PP-Containers_FINAL.pdf (Accessed on 2021-06-23).
[21] https://recyclass.eu/wp-content/uploads/2021/05/RecyClass-Washing-QT-Procedure-for-Paper-Labels-applied-on-HDPE-and-PP-Containers_FINAL.pdf (Accessed on 2021-06-11).
[22] https://recyclass.eu/wp-content/uploads/2021/05/RecyClass-Washing-QT-Procedure-for-Paper-Labels-applied-on-HDPE-and-PP-Containers_FINAL.pdf (Accessed on 2021-06-11).

- ✉ If plastic labels of different material than the container is used on PE or PP containers. Test report from a laboratory fulfilling the conditions in Appendix 4, showing that the label is approved.
- ✉ If paper labels are used: Test report from a laboratory fulfilling the conditions in Appendix 4, showing that the label is approved.
- ✉ Declarations that PVC and other halogenated plastics, aluminium and other metals have not been used. Appendix 5 can be used.
- ✉ For labels of different material than the packaging: Calculation of label size compared to the surface of the container.
- ✉ Declaration from the applicant that direct print is not used except for date codes, batch codes and UFI. Appendix 2 can be used.

Background to requirement O16

The label requirements are based on the findings in a label project run by Nordic Ecolabelling in the summer/autumn of 2020 for laundry detergents, cleaning products and hand dishwashing detergents. Key players within the recycling industry in Sweden (FTI), Finland (Uusiomuovi), Norway (RoAF, Mepex, Norner, Grønt Punkt Norge) and Denmark (Plastindustrien) were consulted, to ensure relevant requirements with respect to the current Nordic waste streams. Furthermore, major label producers and suppliers, as well all Nordic Swan Ecolabel licensees within the above-mentioned product categories were consulted, to ensure achievable requirements.

PE and PP containers should preferably have labels of the same plastic material, in order to facilitate correct sorting by the NIR sensor. However, other label materials are accepted due to the current market situation. To avoid decreasing the final quality of the recyclate further, by introducing different polymers in addition to adhesive and inks, removable labels are preferred. Therefore, passing Recyclass' Washing quick test procedure is required. Moreover, PET and PET-G labels must have a density > 1.0 g/cm^3, to be separated from the PE and PP containers in the float/sink bath. Paper labels must be without fibre loss because residue paper fibres cause quality issues in the recycled plastic. PET containers must have labels with density <1.0 g/ml to ensure correct separation in the float/sink bath. (PET has a density > 1.0 g/ml). Therefore, for the time being, cPET labels are not allowed. Nordic Ecolabelling will consider allowing cPET-labels with the appropriate specifications, if cPET labels become endorsed by EPBP (The European PET Bottle Platform) for PET bottles and/or by RecyClass (www.recyclass.eu). Paper labels must be without fibre loss because residue paper fibres cause quality issues in the recycled plastic. As we have not been able to identify a standardized test for paper labels on PET bottles, we require testing according to Recyclass' "Washing quick test procedure: For paper labels applied on HDPE & PP containers, standard laboratory practice, version 1.0", also for paper labels on PET bottles. If you have suggestions for adaptations to make the test more suitable for paper labels on PET (eg. modified washing temperature or water alkalinity), or if you know about a standardized test for paper labels on PET, please contact us to find out whether the criteria can be updated with your test method.

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

are excluded since they lead to adverse environmental impacts in waste handling.

If the NIR sensor at the sorting facility hits the label instead of the bottle, the bottle may end up in the rejected fraction. Therefore, labels and shrink film labels of different materials than the container must not cover more than 60% of the container surface.

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

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

Metallized labels can be detected by metal detectors causing the packaging to be sorted to reject. Thin metal layers do not seem to possess major problems for the sorting or recycling, if the labels can be separated from the containers[23]. However, these metal materials will not be recycled, and single use of metal is not supportable from a resource point of view. Metal foil embedded in a label, so-called RFID technology is exempt from the requirement though because RFID labels enable traceability of products and can contribute to reduced wastage.

The requirement is new compared with generation 2 of the criteria.

O17 Flexible plastic pouches: Design for recycling

Flexible plastic pouches must have a design that enables material recovery.

Container means flexible plastic pouches, inclusive spout fixed to the plastic pouch.

Closure means e.g. cap, lid, pump, spout, oblate, seal. Please note that a spout that is fixed to the container, counts as part of the container.

- The packaging must contain at least 90% plastic (polyethylene (PE), polypropylene (PP) or polyethylene terephthalate (PET)).
- The individual components of the container and closure must be made from either PE (polyethylene), PP (polypropylene) or PET (polyethylene terephthalate).

  Exceptions:

  - *O-ring of EPDM or other elastomers is allowed in valves.*
  - *Membranes, oblates and seals may be made of thermoplastic elastomer (TPE) based on styrene-ethylene-butylene-styrene thermoplastic elastomer (SEBS), aluminium, paper and plastic of non-monomaterial (but it must be PE, PP and / or PET).*
- The container must be made of monomaterial, i.e., not laminated with layers of different materials. Barrier coatings can only be of EVOH (ethylene vinyl alcohol) and constitute max 5% of the total weight.

  Exception: Flexible plastic pouches may contain multimaterials of PE, PP, PET and / or PA for a transitional period until 31 December 2026. Flexible plastic pouches requiring UN approval according to the ADR Regulation may consist of multimaterials of PE, PP, PET and / or PA until 31 December 2027.
- Carbon black pigments must not be added to container or closure.

[23] https://www.epbp.org/design-guidelines/products (Accessed on 2021-01-04).

- Fillers (such as $CaCO_3$) must not be included in PE or PP containers or closures at a level that the density of the plastic exceeds 0.995g/cm^3.
- Metal must not be part of the container or closure.

  Exception: Metal springs.
- Silicone is not allowed in closures.

✉ Packaging specifications (including all components as container and closure, label etc.) or certificate showing the materials used, density of PE or PP components and whether carbon black has been added. Appendix 5 can be used as part of the documentation.

Background to requirement O17

The requirements for flexible plastic pouches are the same as for plastic packaging and closures, but with the addition that barrier coatings may only consist of EVOH (Ethylene vinyl alcohol) in a maximum of 5% in relation to total weight. This is in line with what the recycling companies recommend so that the recycling process is not adversely affected. Nordic Ecolabelling is aware that it is currently not possible to manufacture flexible plastic pouches from monomaterial. Therefore, flexible plastic bags may consist of multimaterials of PE, PP, PET and / or PA for a transitional period until 31 December 2026. Getting UN approval for packaging containing hazardous mixtures is an additional process. Therefore, flexible plastic pouches requiring UN approval according to the ADR Regulation may consist of multimaterials of PE, PP, PET and / or PA until 31 December 2027.

O18 Paper-based packaging: Design for recycling

1. Cardboard packaging

- Cardboard packaging must contain at least 90% paper/paperboard.
- A minimum of 90% by weight of the wood raw material that is used in the paper/cardboard must be made of recycled material*.
- The remaining proportion of wood raw material (that is not recycled material) must be covered by the FSC/PEFC control schemes (FSC controlled wood/PEFC controlled sources).
- Two-sided plastic laminate is not permitted.
- Polyvinyl chloride (PVC) and other halogenated plastics must not be used in the packaging (container and / or closure).
- Aluminium and other metals must not be used in the packaging (container and / or closure).
- Paper labels are permitted. Other types of labels are not permitted. The label glue must be water soluble.
- Solid coloured cardboard is not permitted

  Exception: White solid coloured cardboard.

2. Corrugated board packaging

- Corrugated board packaging must contain at least 90% paper/paperboard.
- A minimum of 70% by weight of the wood raw material that is used in the paper/cardboard must be made of recycled material*.
- The remaining proportion of wood raw material (that is not recycled material) must be covered by the FSC/PEFC control schemes (FSC controlled wood/PEFC controlled sources).

- Two-sided plastic laminate is not permitted.
- Polyvinyl chloride (PVC) and other halogenated plastics must not be used in the packaging (container and / or closure).
- Aluminium and other metals must not be used in the packaging (container and / or closure).
- Paper labels are permitted. Other types of labels are not permitted. The label glue must be water soluble.
- Solid coloured cardboard is not permitted.

  Exception: White solid coloured cardboard.

** Recycled material is defined in accordance with ISO 14021 in the following two categories:*

Material in the pre-consumer phase. Material that has been taken from the waste flow during the manufacturing process. The exception is the re-use of material that is generated in a process, e.g. waste that can be recycled within the same process that generated it.

Material in the post-consumer phase. Material generated by households or by trade, industry or institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose. This includes the return of materials from the distribution chain. Description of the packaging from the packaging producer showing:

✉ Description of the packaging from the packaging producer showing:

- percentage (by weight) of paper/paperboard material, and percentage of recycled material in wood raw material
- percentage (by weight) of any barrier material; material type and description showing whether the barrier is one- or two-sided
- percentage (by weight) of other materials that might be present in elements such as closure, handles etc. and material type.

  Appendix 5 can be used.

✉ Declaration that any non-recycled wood raw material is covered by the FSC/PEFC control schemes.

✉ Declarations that polyvinyl chloride (PVC) and other halogenated plastics have not been used. Appendix 5 can be used.

✉ Declarations that aluminium and other metals have not been used. Appendix 5 can be used.

✉ If labels are used: Specification from the manufacturer showing that the label is of paper.

✉ If labels are used: Specification from the manufacturer showing that the adhesive is water soluble.

Background to requirement O18

Legislation and infrastructure are in place for paper-/cardboard collection and recycling in the Nordic countries[24]. To promote the use of recycled materials and to save virgin resources, an obligatory requirement on the amount of recycled materials is introduced. The 90% and 70% recycled material requirement levels respectively, are based on current licence data for dishwasher detergents and laundry detergents as well as on further correspondence with stakeholders.

[24] http://norden.diva-portal.org/smash/get/diva2:1304371/FULLTEXT01.pdf Accessed on 2020-12-08.

Two-sided plastic laminate is not allowed since the doble layer impedes the pulpability and leads to a low degree of fibre recovery. Specialized pulpers are required to obtain good fibre recovery for two-sided laminates. A significant proportion of the Nordic board waste is currently not sent to such specialised facilities[25].

PVC and other halogenated plastics are excluded since they lead to adverse environmental impacts in waste handling. Even though aluminum from paper/cardboard packaging can be separated and material recycled, it is excluded due to the energy consumption required in the Aluminuim production. Aluminium is not essential in the packaging within this product group.

Direct print instead of labels is preferable in the recycling process. However, Nordic Ecolabelling has decided to allow paper labels, to provide for flexibility for the producers. For paper labels, water soluble adhesive is preferable in the recycling process[26].

Solid coloured material other than white is not permitted, as this may lead to discolouration of non-coloured fractions in the pulper.

The requirement is new compared with generation 2 of the criteria.

O19 Reuse of packaging

The licensee must either offer to take back primary packaging that is 200 litres or larger or inform the customer that reuse of the packaging is possible via local reuse companies.

✉ If the licensee offers to take back the packaging from the customer: Copy of the offer and a description of how the packaging is taken back and reused.

✉ If the customer is informed about that reuse of the packaging is possible via local reuse companies: Copy of how the information is communicated.

Background to requirement O19

Dishwasher detergents for professional use may be supplied in barrels and in Intermediate Bulk Containers (IBC) that hold up to several thousand litres. Reuse comes higher up the EU's waste hierarchy than material recycling, and this type of packaging is so strong that it can be reused several times over. The licensee does not have steerability over what the customer does with the packaging after use. On the other hand, it is of course possible to encourage or recommend environmentally sound handling of the packaging. The licensee must therefore either offer to take them back for reuse or inform the customer that reuse of the packaging is possible via local reuse companies. In some cases, it is more appropriate to use existing take-back and reconditioning systems than to transport individual packages long distances back to the licensee.

The requirement is new compared with generation 2 of the criteria.

O20 User information

The product's label or accompanying product sheet must include the information below.

- The product's area of use.

[25] Personal communication with Johannes Daae, Grønt Punkt Norge (January 2021).
[26] Personal communication with Cecilia Halling Linder, Fiskeby Board AB (December 2020).

- User instructions with recommended dosing (g/l water) for the relevant water hardness in the area where the product will be used.
- The following environmental advice: *Wash at full capacity as far as possible, avoid over/underdosing, use the lowest possible temperature that delivers a hygienic wash.*
- For plastic packaging smaller than 200 litres: How the packaging should be sorted for recycling in each Nordic country in which it is sold. The Nordic-wide pictogram system from 2020 can be used*.

** The pictograms can be found at:*

https://danskaffaldsforening.dk/the-danish-pictograms-waste-sorting
https://sortere.no/avfallssymboler
https://www.avfallsverige.se/gemensamtskyltsystem/

✉ Copy of label and/or product sheet.

Background to requirement O20

Incorrect use and overdosing of products lead to an increased and unnecessary environmental impact. Nordic Ecolabelling therefore sets a requirement that the product's label or accompanying product sheet must carry clear information on the area of use and the dosing.

To reduce energy use and any impact on the environment, it is important to wash at full capacity as far as possible, avoid over/underdosing and use the lowest possible temperature that delivers a hygienic wash. To avoid unnecessary use of chemicals, it is of the utmost importance not to use too much of the product (overdosing). Using too little of the product (underdosing) should also be avoided, as dirty contents will have to be washed again and this will lead to greater chemical use.

To encourage and facilitate recycling of plastic packaging, information must be provided on how the packaging should be sorted for recycling in each Nordic country in which it is sold.

The requirement is a merger of several previous requirements.

8 Performance

O21 Performance

The product/multicomponent system must perform at least as effectively as equivalent products on the market. The product's efficacy is to be documented in the form of a user test that meets the requirements below:

1. For dishwasher detergents, rinse aids, soaking agents and dishwasher detergents for aluminium goods: At least eight independent users must test the product for at least four weeks under relevant conditions.

   For products used to clean instruments in healthcare: At least five independent users must test the product for at least four weeks under relevant conditions.
2. The product is to be tested at the dose recommended on the packaging label or accompanying product sheet. If the dosage is specified in an interval, at least one test should be performed at the lowest dosage.

3. The product must not be tested in combination with plastic cleaning beads.
4. At least 80% of the users must judge the product to be adequately effective or very effective for all parameters.
5. The user must fill in Appendix 6. All appendices are to be submitted to Nordic Ecolabelling.
6. A test report must be drawn up, describing the user test and including a summary of the results.

☒ Appendix 6 from all users who have tested the product.

☒ Test report describing the user test, including summary of the results.

Background to requirement O21

It is important that Nordic Swan Ecolabelled products perform at least as effectively as equivalent products on the market. The efficacy of the product must therefore be documented by means of a user test.

Institutional kitchens may have dishwashers that clean with plastic beads in combination with chemicals and water. These are effective against heavily soiled items, such as dishes with burned on food, and replace manual scrubbing under running water. Although the plastic beads are within a closed system, they still enter the wastewater system in two forms, either due to wear as tiny pieces of eroded microplastic or as whole plastic beads that have "escaped" from the system.[27]

Microplastics – small fragments of plastic – can have harmful effects on health and the environment. This is because of their size, lack of degradability and tendency to accumulate in living organisms such as fish and shellfish and affect them physically, or because they carry traces of harmful chemicals. There is a lack of knowledge about the effects of plastic, and Nordic Ecolabelling wishes to help reduce discharges of microplastics into the environment. We therefore require Nordic Swan Ecolabelled dishwasher detergents for professional use to be effective without the use of plastic cleaning beads.

The requirement has been changed in terms of the following parameters, in relation to generation 2 of the criteria:

- For products used to clean instruments in healthcare, at least five, instead of eight, independent users must test the product.
- The reference to ISO 15883 has been removed.
- The product must not be tested in combination with plastic cleaning beads.

[27] Svenskt Vatten. Responses to the consultation concerning the Swedish Chemicals Agency's report "Mikroplast i kosmetiska produkter och andra kemiska produkter - rapport från ett regeringsuppdrag". https://www.svensktvatten.se/globalassets/om-oss/remisser/remiss--kemikalieinspektionens-redovisning-mikroplast-i-kosmetiska-produkter-och-andra-kemiska-produkter-.pdf (Accessed on 22.10.2020)

9 Licence maintenance

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

O22 Customer complaints

The licensee must guarantee that the quality of the Nordic Swan Ecolabelled product or service does not deteriorate during the validity period of the licence. Therefore, the licensee must keep an archive over customer complaints.

Note that the original routine must be in one Nordic language or in English.

✉ Upload your company's routine for handling and archiving customer complaints.

Background to requirement O22

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

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

O23 Traceability

The licensee must be able to trace the Nordic Swan Ecolabelled products in the production. A manufactured/sold product should be traceable back to the occasion (time and date) and location (specific factory) of its production and, in relevant cases, also the machine/production line on which it was produced. In addition, it should be possible to connect the product with the actual raw material used.

You can upload your company's routine or a description of the actions to ensure traceability in your company.

✉ Please upload your routine or a description.

Background to requirement O23

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

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

10 Areas without requirements

Packaging

Nordic Ecolabelling has no requirements concerning a weight-to-benefit ratio (WBR) for packaging. The background to this is that there does not appear to be any significant difference in the packaging from the different manufacturers. There also does not appear to be any demand for specially designed packaging in the way that there is in other chemical-technical product groups such as cleaning products and cosmetics. The crucial factors are the packaging's resistance to chemicals and physical stresses and leakage, that the packaging meets the requirements for UN labelling where necessary and well-functioning dosing device and user-friendliness. Professional products are usually supplied in large volumes, which makes the environmental impact of the packaging small in relation to the product's other impacts. However, Nordic Ecolabelling sets requirements concerning maximum dosing to ensure that no heavily diluted products can carry the Nordic Swan Ecolabel. This indirectly affects the amount of packaging material per dose.

It is currently not possible to use PCR for packaging that must be UN-approved. Nordic Ecolabelling therefore does not require a certain proportion of recycled material in the packaging.

11 Changes compared to previous generation

Below is a short list of the key changes compared with the previous generation of the criteria.

Table 7 **Comparison of requirements in generation 2 and 3 of the criteria.**

Requirement Generation 3	Requirement, Generation 2	Same req.	Change	New req.	Comment
O1 Description of the product	R1	X			
O2 Formulation	R2	X			
O3 Classification of the product	R3		X		Classification with H314 is no longer prohibited.
O4 Classification of ingoing substances	R4	X			
O5 Enzymes	R6		X		The term "granulated capsules" is now used instead of encapsulated granules. Sprays with enzymes are allowed if a risk analysis has been done in accordance with AISE's "Exposure measurements of enzymes for risk assessment of household cleaning spray products".
O6 Surfactants	R5	X			
O7 Water-soluble films				X	
O8 Substances prohibited from products	R7		X		"Reactive chlorine compounds" has been changed to "Organic chlorine compounds and hypochlorites" New substances on the list: • Antimicrobial or disinfecting ingredients added for purposes

					other than preservation • Benzalkonium chloride • DTPA (diethylenetriamine pentaacetate) • Phosphates • PFAS • MI (methylisothiazolinone) • Microplastics • Substances categorised as Substances of Very High Concern (SVHC) The definition of endocrine disruptors has been updated.
O9 Certified raw materials from oil palms				X	
O10 Maximum dosing				X	
O11 Long-term environmental effects	R10		X		Hydrogen peroxide is exempted from the requirement.
O12 CDV	R11		X		New division of product types: • Dishwasher detergents • Soaking agents • Products used to clean instruments in healthcare • Rinse aids • Dishwasher detergents for aluminium goods The CDV limit is only stated with chronic values. Requirement tightened up.
O13 Biodegradability – aerobic and anaerobic (aNBO and anNBO)	R12		X		New division of product types: • Dishwasher detergents • Soaking agents • Products used to clean instruments in healthcare • Rinse aids • Dishwasher detergents for aluminium goods Requirement tightened up. Polycarboxylates are exempted from the requirement.
O14 Phosphonates/phosphonic acids	R14		X		New division of product types: • Dishwasher detergents • Soaking agents • Products used to clean instruments in healthcare • Rinse aids • Dishwasher detergents for aluminium goods
O15 Rigid plastic packaging: Design for recycling				X	
O16 Labels for rigid plastic packaging: Design for recycling				X	

O17 Flexible plastic pouches: Design for recycling				X	
O18 Paper-based packaging: Design for recycling				X	
O19 Reuse of packaging				X	
O20 User information	R16, R18 and R19	X			
O21 Performance	R20		X		For products used to clean instruments in healthcare at least five, instead of eight, independent users must test the product. The reference to ISO 15883 has been removed. The product must not be tested in combination with plastic cleaning beads.
O22 Customer complaints	R25	X			
O23 Traceability	R27	X			