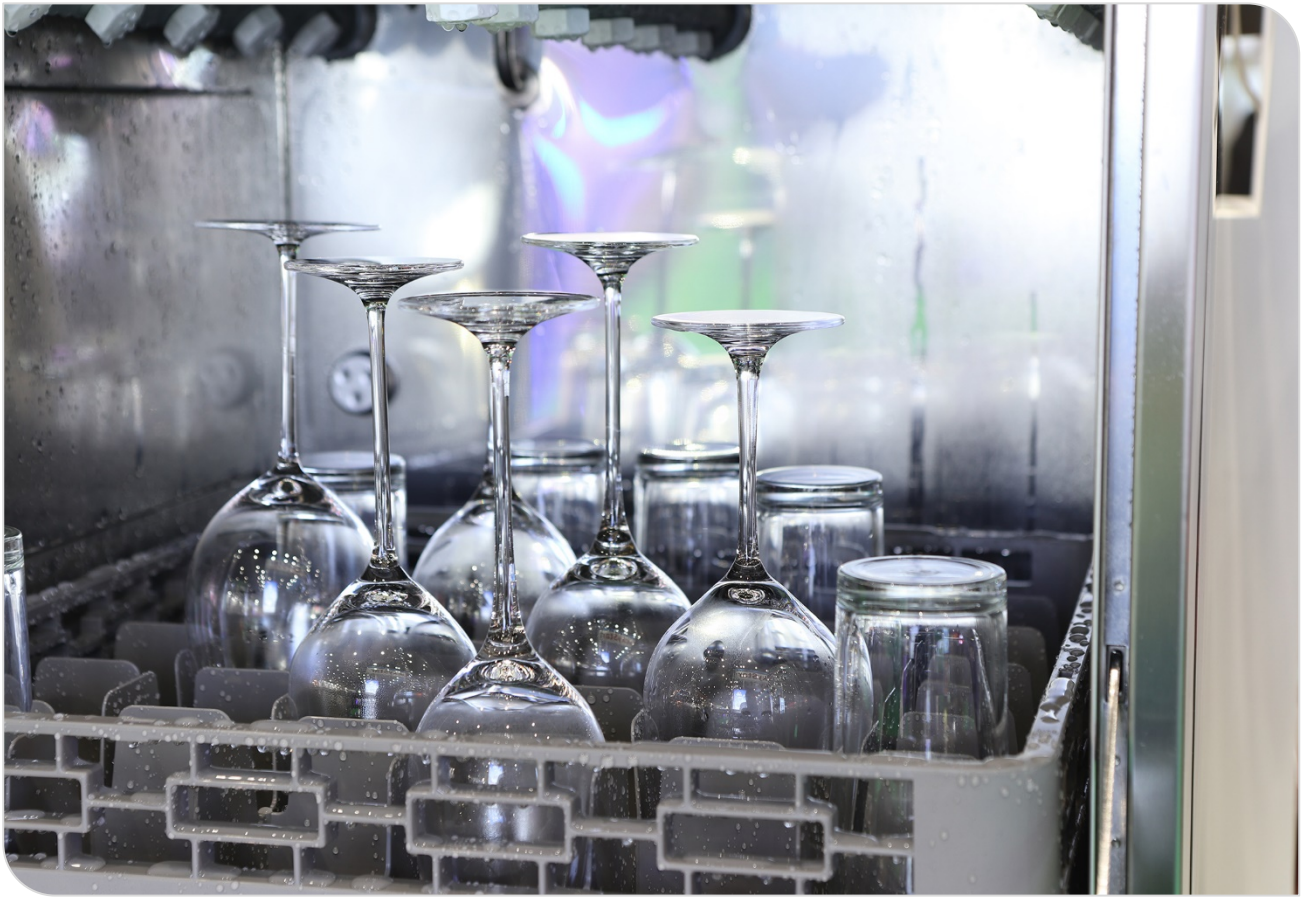
About Nordic Swan Ecolabelled

Dishwasher detergents for professional use



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Consultation proposal

Nordic Ecolabelling

Content

080 Dishwasher detergents for professional use, version 3.0, 23 March 2021

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

Addresses

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:

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What is a Nordic Swan Ecolabelled dishwasher detergent for professional use?

Tough requirements concerning chemicals and packaging ensure that Nordic Swan Ecolabelled dishwasher detergents for professional use reduce the impact on our environment.

Nordic Swan Ecolabelled dishwasher detergents for professional use:

- Meet strict requirements regarding environmentally hazardous chemicals, including requirements targeting ecotoxicity and degradability.
- Comply with tough requirements relating to chemicals that are harmful to health, including a ban on substances that are classified as carcinogenic, mutagenic or reprotoxic. And various specifically problematic substances such as suspected endocrine disruptors on lists from the EU and National authorities.
- Do not contain fragrances.
- Are effective.
- Have packaging that contributes to a circular economy, not least through its design and material choices, with larger packaging being reused.

Why choose the Nordic Swan Ecolabel?

- The licensee may use the Nordic Swan Ecolabel trademark for marketing. The Nordic Swan Ecolabel is a very well-known and well-reputed trademark in the Nordic region.
- The Nordic Swan Ecolabel is a simple way of communicating environmental work and commitment to customers.
- The Nordic Swan Ecolabel clarifies the most important environmental impacts and thus shows how a company can cut emissions, resource consumption and waste management.
- Environmentally suitable operations prepare ski wax for future environmental legislation.
- Nordic Ecolabelling can be seen as providing a business with guidance on the work of environmental improvements.
- The Nordic Swan Ecolabel covers not only environmental issues but also quality requirements, since the environment and quality often go hand in hand. This means that a Nordic Swan Ecolabel licence can also be seen as a mark of quality.

What can carry the Nordic Swan Ecolabel?

Complete dishwasher detergents, multi-component systems, drying agents 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 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.

Dishwasher detergents for specialist machines used in food production, dairies and so on, and products that are entirely or partially sold in supermarkets cannot be Nordic Swan Ecolabelled in line with these criteria.

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. They 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, drying agents and soaking agents affect the environment over the whole of their life cycle. However, the greatest environmental impact occurs after the product has been produced. For example, the majority 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, both aerobic and anaerobic, 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 Swan 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

[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.

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therefore sets ambitious packaging requirements that support recycling and a circular economy.

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 Swan Ecolabelling for Nordic Swan Ecolabelled dishwasher detergent for professional use".

2.1 Definition of the product group

Complete dishwasher detergents, multi-component systems, drying agents 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 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.

Dishwasher detergents for specialist machines used in food production, dairies and so on, and products that are entirely or partially sold in supermarkets cannot be Nordic Swan Ecolabelled in line with these criteria.

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.

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- 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.

Foil and film that is not removed before use of the product is considered part of the formulation.

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 in order 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 number* 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.

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✉ Safety data sheet for each raw material in line with prevailing European legislation (Annex II to REACH (Regulation 1907/2006/EEC)).

Background to requirement O2

Nordic Ecolabelling needs a 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 statement	**Hazard class and category**	**Hazard statement 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

Skin corrosion or irritation	Skin Corr. 1A, 1B or 1C	H314 *Exception:* • *Automatically dosed products may be classified as H314.* • *Manually dosed soaking agents may be classified as H314 if the following conditions are met:* o *The working solution is not corrosive at the highest recommended dose.* o *The product is sold with a dosing pump or is connected via a product hose to a water source that mixes the product into a working solution. The pump must be designed so that it gives the right dose and minimises the risk of exposure. The product does not need to be sold with a pump if the pack is ≤ 1 litre and has a childproof closure in line with ISO 9327:2004.*
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 in line with prevailing European legislation (Annex II to REACH (Regulation 1907/2006/EEC)).

☒ 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.

☒ If an exception is made for H314: Confirmation that the product is dosed automatically or is a manually dosed soaking agent where the working solution, at the highest recommended dose, is not corrosive. Documentation confirming that the product is sold together with a dosing pump (that is designed to deliver the correct dose and minimises the risk of exposure) or is connected via a product hose to a water source that mixes the product into a working solution.

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 health cannot be Nordic Swan Ecolabelled. The risk of the user coming into direct contact with the product is low when using automatically dosed dishwasher detergents and drying agents. However, the user could be exposed to the products in the case of manually dosed dishwasher detergents, drying agents and soaking agents, and when replacing containers and hoses.

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.

Automatically dosed products and manually dosed soaking agents that do not have a corrosive working solution are exempted from the ban on the classification H314. In the case of corrosive, manually dosed soaking agents, a number of supplementary requirements must be met in order for them to be exempted from the classification, see Table 1.

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

4 Requirements concerning ingoing substances

O4 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 < 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 may be used.
- ✉ A valid RSPO Supply Chain certificate from the raw material's producer or supplier.
- ✉ The manufacturer of a Nordic Swan Ecolabelled product must be able to demonstrate, via the raw material supplier's invoices or delivery notes, that the purchased palm oil is certified, and confirm the traceability system used (Mass Balance, Segregated and Identity Preserved are accepted).

Background to requirement O4

Special attention is paid to palm oil which raises concerns on e.g., land use. The Nordic Swan Ecolabel's primary approach 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.

O5 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 statement	**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 O9.*
- *Enzymes (including stabilisers in the enzyme raw material).*

Note that, under this requirement, titanium dioxide is prohibited in solid mixtures (e.g., in enzymes) from 1 October 2021.

✉ Safety data sheet for each raw material in line with prevailing European legislation (Annex II to REACH (Regulation 1907/2006/EEC)).

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

Background to requirement O5

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 today.

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 enzymes need a certain amount of time to work.

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

O6 Enzymes

Enzymes may only be present in the product in liquid form or as encapsulated granules.

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

Background to requirement O6

Enzymes may only be present in the product in liquid form or as encapsulated granules, 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].

The ban on enzymes in spray products has been removed. The requirement is otherwise unchanged compared with generation 2 of the criteria.

O7 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 degradable 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, with at least 60% degradability under anaerobic conditions.

✉ 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 O7

Surfactants are used primarily in drying agents 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.

O8 Water-soluble films

All water-soluble films (e.g., PVA films) used in dishwasher detergents must be 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.

The test must be performed on the actual film that is supplied to the manufacturer of the dishwasher detergent.

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

✉ Test report documenting the film's biodegradability, conducted by a certified test laboratory in line with Appendix 4.

Background to requirement O8

Water-soluble films (e.g., poly vinyl alcohol, PVA) that encapsulate the dishwasher detergent is not considered microplastics according to the definition used in this criteria (see requirements O8), 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 environmetal 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 e.g., naturally biodegradable polymers, inorganic substances, surfactants or other plastics. 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. These aspects make it difficult to compare biodegradation rates of different PVA products with other polymers classified as biodegradable.

A review from 2011 based on 68 scientific studies on identification and quantification of microplastics from the marine environment, found PVA in three studies[4]. 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 utilisation of PVA in dishwasher detergents may lead to discharge of plastics in the waste water stream if the films are not easily biodegradable.

The biodegradability test must be conducted on the actual film that is supplied to the dishwasher detergent manufacturer, to ensure that all factors that may influence the biodegradability is included.

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

O9 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
- Borates and perborates
- DADMAC (dialkyldimethylammonium chloride)
- DTPA (diethylenetriamine pentaacetate)
- EDTA (ethylenediaminetetraacetic acid) and its salts

[4] 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.

- Phosphates
- Endocrine disruptors (whether potential or identified) according to one of the following lists:

  1) The European Commission's list of substances to be prioritised for evaluation of endocrine disrupting properties, categories 1 and 2.

  https://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf (Appendix L Updated ranked priority list, page 238)

  2) The EU member state initiative "Endocrine Disruptor Lists", Lists 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
- LAS (linear alkylbenzene sulphonates)
- MI (methylisothiazolinone acid, CAS no. 2682-20-4)
- Microplastics

  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 foils and films that enclose tablets and that generate microplastics must not be present in Nordic Swan Ecolabelled products.

  Note that Nordic Ecolabelling follows the 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, TiO2, SiO2 and Ag. Polymer emulsions are not considered to be a nanomaterial.

- NTA (nitrilotriacetic acid) 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%.

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- Organic chlorine compounds and hypochlorites

  Exception: Preservatives may contain organic chlorine compounds.
- Fragrances
- 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 O9

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.

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

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.

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

Benzalkonium chloride

In contrast to many other quarternary ammonium compounds, benzalkonium chloride is readily biodegradable, but it is undesirable due to its association with bacterial resistance, its toxicity and its allergenic properties.

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

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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.

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

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 in order to simplify the administrative process.

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

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.[5] 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.

The ban on DTPA is new for this generation of the criteria.

Phosphates

Plants, animals and people all depend on phosphorus in order 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. With the exception of Morocco, many of these countries are already beginning to run out of extractable phosphorus.[6] Since there are alternatives, Nordic Ecolabelling has chosen to prohibit the use of phosphates.

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

[5] 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).
[6] 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 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 are 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. A substance listed on any of List I, II and/or III is excluded. List I contains substances identified as EDs at EU level; List II contains substances under ED evaluation under an EU legislation; and List III is for substances considered by a national authority to have endocrine disrupting properties. All substances on Lists I–III are excluded from all raw materials and products as specified in the requirement, meaning that substances listed with reference to e.g., the Cosmetics regulation are not just excluded from cosmetics.

The companies are responsible for keeping track of updates on the lists, for their labelled products to comply with the requirement throughout the validity of the licences. Nordic Ecolabelling acknowledges the challenges associated with new substances being introduced on particularly Lists 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. In some cases, List I substances might also be up for consideration, e.g., concerning some EDs identified under the Biocides regulation.

The requirement concerns the main lists (Lists 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 is also on any of the other main Lists I–III. Special attention is needed concerning those List II substances that are evaluated under the Cosmetics regulation. Since it is not within the scope of the regulation to identify EDs, it is not yet clear how the substances will be handled at www.edlists.org once the evaluation (safety assessment of the substances in cosmetics) is finalised. Nordic Ecolabelling will evaluate the circumstances on a case-by-case basis.

For the time being, the Nordic Swan Ecolabel also continues to exclude potential EDs that have been prioritised for evaluation within the European Commission's "Community strategy for endocrine disruptors". This concerns substances in category 1 and 2 of the priority list from 2007 (https://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf, Appendix L Updated ranked priority list, page 238). A potential ED on the list might be exempted if it has since been evaluated and found not to be an ED

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under EU legislation and is neither listed at www.edists.org. Nordic Ecolabelling evaluates the circumstances on a case-by-case basis.

By these means, the Nordic Swan Ecolabel ensures a restrictive policy on EDs.

The definition of endocrine disruptors is updated in relation to generation 2 of the criteria.

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.

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

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.

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

Microplastics

Nordic Ecolabelling has opted to use the EU Ecolabel's definition of microplastics, since the definition used in the ECHA's proposal for a restriction on the use of intentionally added microplastics is still under development.[7]

Generally speaking, when microplastics are washed into the sewerage system, they mostly end up in the sludge at water treatment plants, but some also pass through. If the plastic particles continue on into lakes and the sea, they are consumed by mussels, fish and other animals and cause damage. Some microplastics are then gradually broken down by sunlight into even smaller particles. The particles can also absorb harmful compounds. It is therefore important to be extra careful about what is permitted.

Note that foils and films that enclose tablets and other such products that release microplastics are not permitted in Nordic Swan Ecolabelled products.

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

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

[7] Annex XV Restriction dossier concerning the use of intentionally added microplastic particles, version number: 1, 11 januari 2019, https://echa.europa.eu/documents/10162/82cc5875-93ae-d7a9-5747-44c698dc19b6

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organisations and others about the lack of knowledge regarding the potential detrimental effects on health and the environment.

The requirement has been updated compared with generation 2 of the criteria.

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 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%.

The impurity limit for the raw material has been tightened compared with generation 2 of the criteria.

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.

Organic chlorine compounds and hypochlorites have been added to the list instead of “reactive chlorine compounds”, compared with generation 2 of the criteria.

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.

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

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

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(Directive 1907/2006/EC).[8] 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 on the basis of 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.

The requirement concerning PBT and vPvB substances is the same as in generation 2 of the criteria.

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 is new compared with generation 2 of the criteria.

5 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

Dishwasher detergents and soaking agents may have a maximum dosing of 8.0 grams per litre of water.

Drying agents may have a maximum dosing of 4.0 grams per litre of 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) is to set a maximum limit for the dosing of dishwasher detergents and

[8] 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

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drying agents. The requirement level has been set on the basis of licence data, to 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 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.

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 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, with at least 60% degradability under anaerobic conditions.*

✉ 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).

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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. Other requirements (classification of the product and CDV) restrict the use of these surfactants to a certain extent.

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. Protease is exempted from the requirement in order to ensure good performance from products for which the use of enzymes is relevant.

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

O12 CDV

The product's critical dilution volume (CDV) must not exceed the maximum values stated in Table 3.

Table 3 **CDV threshold value**

Product type	$CDV_{chronic}$
Dishwasher detergents and soaking agents	1500 litres/litre water
Products used to clean instruments in healthcare	3000 litres/litre water
Drying agents	1500 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 gives more precise/reliable estimates of potential environmental effects compared with acute toxicity data. The threshold values have been set on the basis of 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 in terms of the following:

- Products used to clean instruments in healthcare are a separate product type.
- Only chronic values are given for the CTV 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 biodegradable (aNBO) or not anaerobically biodegradable (anNBO) must not exceed the threshold values stated in Table 4.

Table 4 **Threshold values for aNBO and anNBO**

Product type	aNBO	anNBO
Dishwasher detergents and 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
Drying agents	0.04 g/litre water	0.04 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.

Note that all surfactants must be aerobically and anaerobically biodegradable under requirement O7.

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

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✉ 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 biodegradable (aNBO) or not anaerobically biodegradable (anNBO). Nordic Ecolabelling's calculation sheet must be used. It is available from Nordic Ecolabelling's websites.

Background to requirement O13

The general requirement concerning the permitted amount of non-readily aerobically biodegradable and non-aerobically biodegradable substances cuts the use 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.

The threshold values have been tightened for dishwasher detergents based on data that Nordic Ecolabelling has for products that hold ecolabelling licences. The threshold values for drying agents remain unchanged.

O14 Phosphonates/phosphonic acids

The product's content of phosphonates/phosphonic acids must not exceed the maximum values stated in Table 5.

Table 5 **Threshold values for content of phosphonates/phosphonic acids**

Product type	Phosphonates/phosphonic acids
Dishwasher detergents and soaking agents	0.01 g/litre water
Products used to clean instruments in healthcare	0.01 g/litre water
Drying agents	0.006 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.

6 Packaging and user information

Packaging, plastic, and recycling of plastic is a focus area in society today. Nordic Ecolabelling wants to set 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 criterion O15-O17 can currently be used. 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.

Foil and film that is not removed before use of the product is considered part of the formulation and not as packaging.

**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, dosing device, oblate, seal 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:

  - *Thermoplastic elastomer (TPE) based on styrene-ethylene-butylene-styrene thermoplastic elastomer (SEBS) is allowed as membranes in squeeze-bottle closures made of PE or PP.*
  - *Oblate and seals may be made of aluminum and paper if they are separable from the container or closure.*
- It is not allowed to add pigments to PET. Coloured, recycled PET-granulate where the pigment originates from the recycled material is allowed.
- 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.
- Silicone is not allowed in closures.

✉ Packaging specifications (including all components as container and closure, label etc.) or certificate showing the materials used, component weights and

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which pigments have been added. Appendix 5 can be used as part of the documentation.

✉ Documentation showing that the density limit is not exceeded.

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[9] that has a clear focus on recovery and recycling, particularly with regards to packaging material. EU has also accepted a plastic strategy[10] 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[11] are the base for the requirement stating that plastic bottles/containers and closures must be made 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. TPE based on TPE-PE, TPE-PP and SEBS is allowed as membranes in squeeze-bottle closures made of PE or PP. These are compatible with PE/PP, hence small amounts will not disturb the recycling process or quality. Membranes on closures attached to PET-bottles must have a density < 1.0 g/cm2, in order to separate from the PET during the sink/float process[12].

Oblate and seals are used because closures must be guaranteed to be tight in all handling, even when transporting large quantities. Many conveyors use automatic machine sorting where packages are handled very harshly. Then ordinary corks are not enough, but a oblate is required if the packaging is to be

[9] 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

[10] 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)

[11] "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)
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);

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

tight. Wafers and seals are a small part of the packaging and they are also allowed to be made of aluminium and paper if they are separable from the Colourless plastics have the highest recovery value. Dark colours result in darker recycled fraction, which is not preferable. Carbon black cause problems in automated sorting plants, as the NIR (near infrared reflectance) detector cannot identify dark colours produced with carbon black.

For PE and PP carbon black is excluded from packaging and closures, to contribute to visually lighter recycled fraction, and to avoid issues with NIR-detection. 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 0.995g/cm3. 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[13, 14].

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.

O16 Labels for rigid plastic packaging: Design for recycling

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

- Containers in polyethene (PE) and polypropylene (PP), must have a label label with the same plastic material as the packaging (i.e. PE-label on PE packaging and PP-label on PP packaging).
- Packaging in polyethylene terephthalate (PET) must have a label of a different plastic material, with a density < 1.0 g/ cm3.

Note: For the time being, cPET labels are not allowed. Nordic Ecolabelling will consider to allow cPET-labels with the appropriate specifications, if cPET labels become endorsed by EPBP (The European PET Bottle Platform) for PET bottles and/or by RecyClass (www.recyclass.eu).

- PET-G (polyethylene terephthalate glycol modified), polyvinyl chloride (PVC) and other halogenated plastics must not be used in labels.
- Paper labels must not be used.
- Metallized labels/shrink film labels are not permitted.
- For labels of different material than the packaging (PET containers): 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.

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

- 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 Declaration from the manufacturer(s) of the packaging can be used as part of the documentation.

✉ Declarations that PET-G, PS, PVC and other halogenated plastics, paper, aluminium and other metals have not been used. Appendix 5 can be used.

✉ For labels of different material than the packaging (PET containers): 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 (Unique Formula Identifier). 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, in order to ensure relevant requirements with respect to the current Nordic waste streams. Furthermore, major label producers and suppliers, as well all Nordic Swan Ecolabel licensees within the above-mentioned product categories were consulted, to ensure achievable requirements.

PE and PP containers must have labels of the same plastic material, in order to facilitate correct sorting by the NIR sensor.

PET labels must have labels with density <1.0 g/ml to ensure correct separation in the float/sink bath. (PET has a density > 1.0 g/ml). As a consequence, for the time being, cPET labels are not allowed. Nordic Ecolabelling will consider 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).

PET-G labels/shrink film labels are excluded 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.

Paper labels are prohibited because residue paper fibres cause quality issues in the recycled plastic.

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.

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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[15]. However, these metal materials will not be recycled, and single use of metal is not supportable from a resource point of view.

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

O17 Reuse of packaging

The licensee must take responsibility for ensuring that primary packaging in sizes of 200 litres or more is taken back from the customer and reused until it no longer meets any UN labelling requirements, is broken or cannot be used again for some other reason.

✉ Description of how the packaging is taken back from the customer and how it is reused.

Background to requirement O17

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 is therefore responsible for ensuring that such packaging is taken back from the customer, either by the actual licensee themselves or by a third party. Whatever the case, the packaging should be reused until it no longer meets any UN labelling requirements, is broken or cannot be used again for some other reason.

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

O18 Paper-based packaging for solid products: Design for recycling

1. Cardboard packaging

- Cardboard packaging for solid products 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 post-consumer/commercial recycled material (PCR)*.
- The remaining proportion of wood raw material (that is not PCR) must be covered by the FSC/PEFC control schemes (FSC controlled wood/PEFC controlled sources).
- Two-sided plastic laminate is not permitted.
- PVC or plastic based on other types of halogenated plastics must not be used in the packaging (container and closure).
- Aluminium and other metals must not be used in the packaging (container and closure).
- Labels are not permitted.
- Direct printing on the packaging must be done with water-based inks.

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

2. Corrugated board packaging

- Corrugated board packaging for solid products 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 post-consumer/commercial recycled material (PCR)*.
- The remaining proportion of wood raw material (that is not PCR) must be covered by the FSC/PEFC control schemes (FSC controlled wood/PEFC controlled sources).
- Two-sided plastic laminate is not permitted.
- PVC or plastic based on other types of halogenated plastics must not be used in the packaging (container and closure).
- Aluminium and other metals must not be used in the packaging (container or closure).
- Labels are not permitted.
- Direct printing on the packaging must be done with water-based inks.

** Post-consumer/commercial recycled material is defined in the requirement according to ISO 14021:2016:*
"Post-consumer/commercial" is defined as material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

✉ Description of the packaging from the packaging producer showing:

- percentage (by weight) of paper/paperboard material, and percentage of PCR 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-PCR wood raw material is covered by the FSC/PEFC control schemes.

✉ Declarations that PVC and other plastic based on other types of halogenated plastics has not been used. Appendix 4 can be used.

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

✉ Declarations that water-based inks are used for direct printing. Appendix 5 can be used.

Background to requirement O18

Legislation and infrastructure are in place for paper-/cardboard collection and recycling in the Nordic countries[16]. To promote the use of recycled materials and to save virgin resources, an obligatory requirement on the amount of post-consumer recycled materials (PCR) is introduced. The 90% and 70% PCR requirement levels respectively, are based on current licence data for dishwasher detergents and laundry detergents, indicating that these levels are achievable.

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

Stakeholder input during the revision of laundry detergents and stain removes in 2019 suggested that it is difficult to achieve more than 70% PCR in bigger, corrugated board packagings, due to material strength requirements.

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[17].

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, and use of water-based inks, is preferable in the recycling process [18].

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

O19 User information

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

- The product's area of use.
- 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.*
- How the packaging should be sorted/recycled in each Nordic country in which it is sold. The Nordic-wide pictogram system from 2020 must be used*.

  Exception: Plastic packaging that holds 200 litres or more.

** 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 O19

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 encourage and facilitate recycling, information

[17] Personal communication with Johannes Daae, Grønt Punkt Norge (January 2021).
[18] Personal communication with a representative from a recycling facility (December 2020).

must be provided on how the packaging should be sorted/recycled in each Nordic country in which it is sold.

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.

The requirement is a merger of several previous requirements.

7 Performance

O20 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, drying agents and soaking agents: 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.
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 O20

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.[19]

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 effect 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.

8 Licence maintenance

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

O21 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 O21

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

[19] 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)

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implemented in your company as described. The customer complaints archive will also be checked during the visit.

O22 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 O22

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.

9 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, physical stresses and leakage, and where necessary, that the packaging meets the requirements for UN labelling. 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.

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10 Changes compared to previous generation

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

Table 6 **Comparison of requirements for dishwasher detergents for professional use in generation 2 and 3 of the criteria.**

Requirement, Draft for consultation 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			
O4 Certified raw materials from oil palms				X	
O5 Classification of ingoing substances	R4	X			
O6 Enzymes	R6		X		The ban on enzymes in spray products has been removed.
O7 Surfactants	R5	X			
O8 Water-soluble films				X	
O9 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 • MI (methylisothiazolinone) • Microplastics • Substances categorised as Substances of Very High Concern (SVHC) Definition of endocrine disruptors has been updated.
O10 Maximum dosing				X	
O11 Long-term environmental effects	R10	X			
O12 CDV	R11		X		Products used to clean instruments in healthcare are a separate product type. The CDV limit is only stated with chronic values. Requirement tightened up.

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O13 Biodegradability – aerobic and anaerobic (aNBO and anNBO)	R12		X		Products used to clean instruments in healthcare are a separate product type. Requirement tightened up.
O14 Phosphonates/phosphonic acids	R14	X			
O15 Rigid plastic packaging: Design for recycling				X	
O16 Labels for rigid plastic packaging: Design for recycling				X	
O17 Reuse of packaging				X	
O18 Paper-based packaging for solid products: Design for recycling				X	
O19 User information	R16, R18 and R19	X			
O20 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.