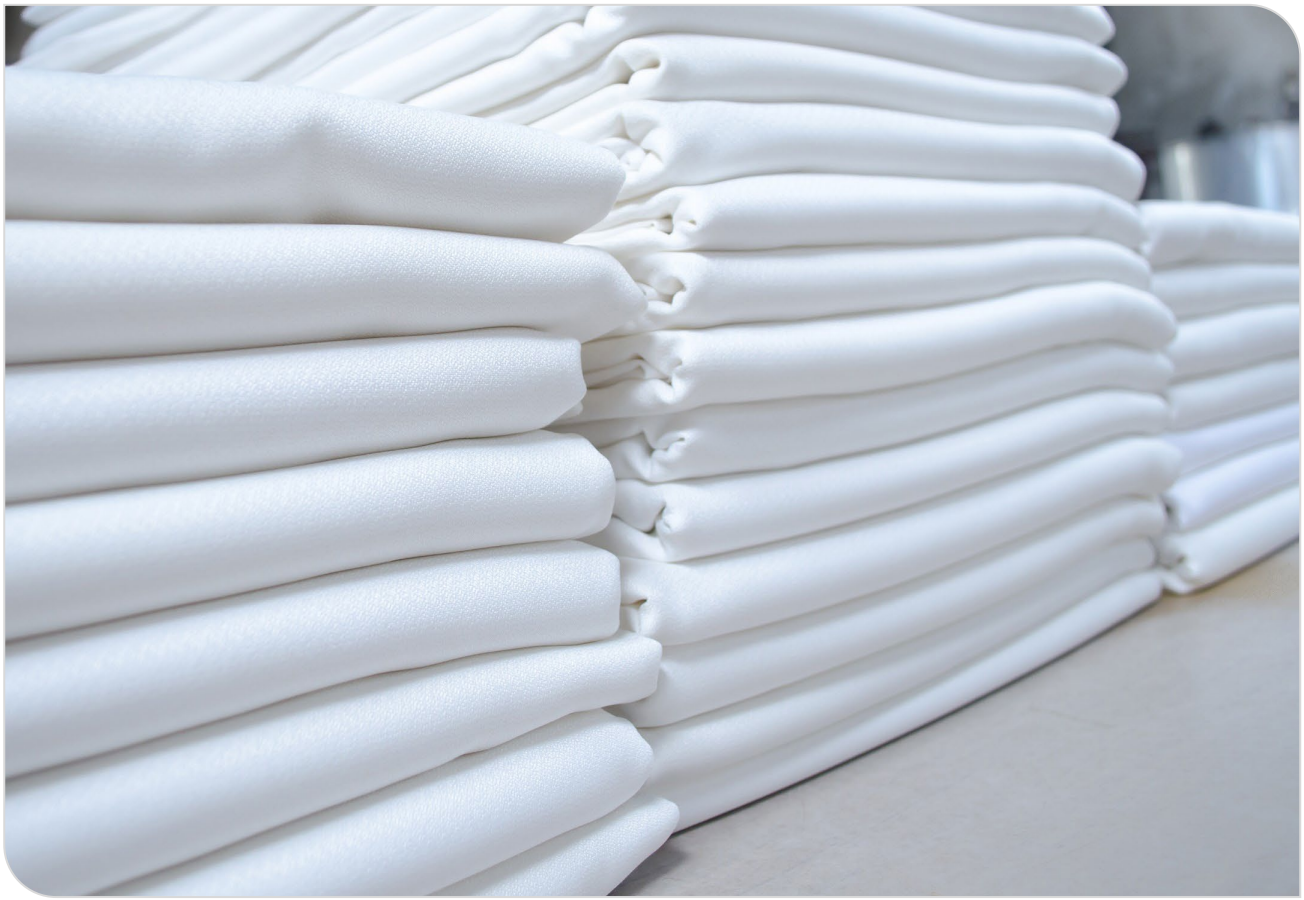
About Nordic Swan Ecolabelled

Laundry detergents for professional use



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Nordic Ecolabelling

Content

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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:

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1 Summary

Nordic Swan Ecolabelling of laundry detergents for professional use is highly relevant. It is a large product group on the Nordic market and affect the environment over the whole of the life cycle.

Laundry detergents for professional use are primarily used in large laundries, hotels, and hospitals/healthcare institutions, but also in smaller laundries in study centres, restaurants, communal laundries in blocks of flats, etc.

The product group contains both complete laundry detergents and multi-component systems where several sub-components together comprise a complete system designed for a wash program. Only products that are effective from 40°C or lower for light and medium soiling and 60°C or lower for heavy soiling can be Nordic Swan Ecolabelled.

Properties such as biodegradability, bioaccumulation and ecotoxicity for aquatic organisms are important environmental parameters for all ingredients. Nordic Ecolabelling also sets requirements concerning health, including a ban on substances that are classified as carcinogenic, toxic to reproduction, can damage genetic material or are allergenic/sensitizing. Other important parameters are dosing and efficiency, certification of sustainable, renewable raw materials and design for recycling of packaging and reuse of plastic packaging.

The most important changes compared to generation 3 are:

- The system with A and B products is removed. Only products that are effective from 40°C or lower for light and medium soiling and 60°C or lower for heavy soiling can be Nordic Swan Ecolabelled. If the product is marketed as being effective at lower temperatures, it must fulfil the efficiency test at that temperature.

- The list of substances that are excluded from use in products is extended with: Benzalkonium chloride, bisphenols, phosphates, MI (methylisothiazolinone), microplastics, NTA and colorants.

- The definition of endocrine disruptors has been updated.

- Palm oil, palm kernel oil and derivatives of palm oil or palm kernel oil must have RSPO certification and sugarcane must be certified to Bonsucro standard (EU REDII approved), version 5.1 or later version.

- The CDV limit is only stated with chronic values. The limit values for CDV have been tightened for all degrees of soiling.

- Biodegradability requirements - aerobic and anaerobic (aNBO and anNBO) have been tightened for all degrees of soiling.

- The requirement on long-term environmental effects has been removed.

- Packaging requirements regarding design for recycling and reuse of plastic packaging have been introduced.

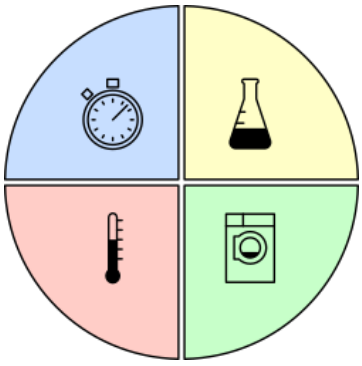
2 Environmental impact of laundry detergents for professional use

Laundry detergents for professional use are primarily used in large laundries, hotels, and hospitals/healthcare institutions, but also in smaller laundries in study centres, restaurants, communal laundries in blocks of flats, etc. There are many different laundry detergents for professional use on the market. Some products for professional use are like laundry detergents for consumers, a complete laundry detergent in powder or liquid form (single-component products). Other detergents comprise several sub-components that together comprise a complete system designed for a wash program. Sub-components that may be included are pre-wash agents, main detergents, wash boosters, bleaching agents, fabric softeners, detergents for delicate fabrics and stain removal agents. These sub-components are mixed automatically on-site, so the composition of the detergent can vary to a certain extent, depending on the type of wash, type of wash program, and the degree of soiling of the laundry to be washed.

Generally, professional washing is carried out at higher temperatures using more effective, strongly alkaline detergents than normal consumer washing.

Washing is affected by four independent factors: Temperature, chemicals, mechanical action, and wash time. If one factor is reduced, the loss must be compensated by increasing one or more of the other factors. These four factors are also known as the Sinner Circle[1], shown in Figure 1.

Figure 1 The Sinner Circle[2]



The table below shows an overall analysis of the product group in terms of MECO and RPS. MECO stands for Material, Energy, Chemicals and Other aspects, while RPS means Relevance, Potential and Steerability. The MECO analysis describes the product group's environmental impact and therefore contributes mainly to the Relevance category in the subsequent RPS analysis. Relevance is assessed based on which environmental problems the product group causes and how extensive those problems are. Potential is assessed in terms of potential environmental benefits within the specific product group. Steerability is assessed

[1] http://www.voussert.com/sinner-circle-leg43.html
[2] https://sv.wikipedia.org/wiki/Sinners_cirkel (accessed on 2022-08-10)

based on the extent to which the Nordic Swan Ecolabel can do anything about the environmental problems.

All the areas in the MECO analysis that are judged to have high RPS are marked with colour. Nordic Ecolabelling sets requirements in all the areas with high RPS in the criteria for the Nordic Swan Ecolabelling of laundry detergents for professional use.

Table 1 Analysis of the product group in terms of MECO and RPS

	Material phase	Production phase	Use phase	Waste phase	Transport
Materials	Packaging material	Production of plastic and plastic components Equipment	Water consumption Raw materials for production of electricity Dosing	Packaging is incinerated, reused or recycled	Fuel for distribution
Energy	Energy for cultivation, refining and production of raw materials	Energy use and CO_2 emissions during the process (packaging production and mixing of chemicals)	Energy consumption in washing	Energy for treatment of water Energy from incineration of packaging	Transport of raw materials, packaging materials and finished products
Chemicals	Extraction of surfactants, non-renewable raw materials (eg phosphorous) and other raw materials from oil or plants (renewable resources)	Chemicals for washing equipment between batches and oil to maintain machinery	Exposure of chemicals	Degradability, allergies, toxic to aquatic organisms, dosing / overdosing	-
Other	Working conditions	Working conditions	Noise from washing machines and tumble driers	-	Particulate matter and emissions from distribution vehicles Eco driving and logistics

Laundry 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 washing machine and to heat the water. Therefore, only products that are effective from 40°C or lower for light and medium soiling and 60°C or lower for heavy soiling can be Nordic Swan Ecolabelled.

Also, for 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.[3] Properties such as biodegradability, bioaccumulation and ecotoxicity for aquatic organisms are therefore important environmental parameters for all ingredients.

[3] 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.

Due to the risk of exposure to chemicals during both production and use, all ingredients must comply with tough requirements concerning health, including a ban on substances that are classified as carcinogenic, toxic to reproduction, can damage genetic material or are allergenic/sensitising. And various specifically problematic substances such as identified and potential endocrine disruptors on up-to-date lists from EU and national authorities.

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

In laundry detergents for professional use, many of the raw materials are organic substances. Both renewable and non-renewable organic raw materials are used, as well as raw materials that are synthesised from both renewable and non-renewable sources. In the long term, the amount of non-renewable raw materials is limited since they are extracted from fossil oil. Renewable raw materials, on the other hand, are replenished through natural processes, but it is important that they are produced sustainably in order to reduce their environmental impact. Possible negative effects of non-sustainable production of renewable raw materials include the use of environmentally harmful pesticides, genetic modification and use of land that was originally a key biotope, such as rainforest, or that could have been used for food production. Nordic Ecolabelling therefore sets requirements that emphasise the purchase of sustainable, renewable raw materials.

In "Closing the loop – An EU action plan for the Circular Economy"[4], 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 regarding packaging material. Nordic Ecolabelling therefore sets ambitious packaging requirements that support recycling and a circular economy.

2.1 The UN Sustainable Development Goals

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

Nordic Swan Ecolabelling actively helps towards fulfilling Goal 12, "Ensure sustainable consumption and production patterns". Nordic Swan Ecolabelled laundry detergents for professional use have a reduced environmental impact from production, use and through design that promotes recycling of packaging.

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

- Strict chemical requirements ensure minimal harmful effects on the soil and aquatic environment. For example, the chemicals must be 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

[4] European Commission. 2015. Closing the loop – An EU action plan for the Circular Economy.

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.
- The products must be effective, which ensures efficient use of resources, and provide the opportunity for energy savings in professional laundries.
- Prohibition of phosphate consisting of the non-renewable natural resource phosphorus.

Nordic Ecolabelled laundry detergents for professional use contribute to other global 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 14: Reduces water pollution

- 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: Protects biodiversity by reducing pollution to land

- 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.

3 Justification of the requirements

This chapter presents new and revised requirements, explains the background to them, the chosen requirement levels and any changes compared with generation 3. The appendices referred to are those that appear in the criteria document "Nordic Swan Ecolabelling of laundry detergents for professional use, generation 4".

3.1 Definition of the product group

The phrase "laundry detergents for professional use" refers to products intended for washing fabrics in water, and that are intended for use by professional users and large-scale consumers. Professional users are laundries that use large washing machines, often with continuous batch washers, and with external customers. Large-scale consumers include for example hotels, hospitals and multi-family residentials with shared laundry rooms, with somewhat larger washing machines than those in normal households. For multi-family residentials with shared laundry rooms, the dosing must be automated.

The criteria include both complete powder and liquid laundry detergents and multi-component systems. A multi-component system is a detergent system where different sub-components build up a complete detergent, a stock solution, or a washing program for automatic dosing. Such a system can for example consist of pre-wash agent, main detergent, wash booster, bleach and neutralizing agent. As a minimum, a Nordic Swan Ecolabelled multi-component system must contain the sub-components that are necessary to wash fabrics clean and fulfil the requirement for effectiveness.

In cases where the ingredients/raw materials are mixed in an automated process in direct connection to the washing machine, the ingredients/raw materials are considered as sub-components in a multi-component system.

Fabric softeners and stain removers can only be Nordic Swan Ecolabelled if they are part of a multi-component system.

Only products that are effective from 40°C or lower for light and medium soiling and 60°C or lower for heavy soiling and that are primarily intended for washing in soft water (0-6 °dH) can be Nordic Swan Ecolabelled. If the product is marketed as being effective at lower temperatures, it must fulfil the efficiency test at that temperature.

Laundry detergents have better washing effect in soft water than in hard water at the same dosing. In Denmark in particular, but also in certain other areas in the Nordics where the water is hard, laundries often soften the water before the wash process. Softening water usually involves the addition of a water softener; this reduces consumption of laundry detergent and reduces limescale in washing machines. However, the products can still be used in hard water.

The criteria include all products that come into contact with the textiles during washing. However, special impregnating agents with, for example, water-repellent or flame-retardant functions, colours for dyeing textiles and products where microorganisms have been deliberately added are not included in the product group definition. Impregnating agents entail risk for content of undesirable environmental toxins, such as certain flame retardants and water-repelling chemicals. Colours that are intended to retain their strength even after several washes, are often not readily degradable, and so remain in the environment for a long time. Regarding microorganisms, there are still considerable knowledge gaps, uncertainties regarding effect/safety, mechanisms of action, and insufficient transparency on the content of microbial-based products.[5]

Products that, wholly or partly, are intended for consumers and sold in grocery stores, cannot be Nordic Swan Ecolabelled in line with these criteria. For these products, the criteria for Nordic Ecolabelling of laundry detergents and stain removers applies.

Products within the scope of the Biocides Regulation 528/2012 cannot be Nordic Swan Ecolabelled.

3.2 Environmental requirements

The environmental requirements are divided into two parts:

2.2.1 General requirements that must be fulfilled by all products and all sub-components in a multi-component system.

2.2.2 Total content of environmentally harmful substances that apply to the total environmental impact of a complete laundry detergent or a multi-component system.

The requirements in the criteria document and accompanying appendices apply to all ingoing substances in the Nordic Swan Ecolabelled laundry detergent 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

[5] https://vkm.no/download/18.2375207615dac0245aee3b46/1503327806306/cfd9b13361.pdf (assessed on 2022-11-14)

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.

3.3 General requirements

O1 Description of the product

The applicant must provide the following information about the laundry detergent or the multi-component system:

- Description of the product's area of use.
- If it is a multi-component system, an overview of the ingoing sub-components.
- Recommended dosing for light, medium and heavy soiling in ml or grams per kg laundry. For multi-component systems, the dosing must be stated for each sub-component.
- The recommended washing temperature* for the different degrees of soiling. The product must fulfil the efficiency test in requirement O18 at the recommended washing temperature.
- The product’s volume or weight.
- All trade names if the product is sold in multiple countries.

** Note that only products that are effective from 40°C or lower for light and medium soiling and 60°C or lower for heavy soiling can be Nordic Swan Ecolabelled.*

✉ 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 clarified compared with generation 3 of the criteria.

O2 Formulation

The applicant must provide a complete formulation for the laundry detergent or the multi-component system. For multicomponent systems, the formulation must be given for all the separate sub-components. The formulation must contain the information below for each ingoing raw material. If a raw material contains of two or more substances, each substance must be declared.

- Trade name
- Chemical name of main component and any additives (e.g., 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 contact information on page 3.*

✉ The complete formulation of the laundry detergent or the multi-component system 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 to check that it meets the requirements.

The requirement is unchanged compared with generation 3 of the criteria.

O3 Classification of the product

The product must not be classified in accordance with hazard classes described in the table below.

Table 2 Classification of the product

Classification of chemical products CLP Regulation 1272/2008:		
Hazard statement	**Hazard class and category**	**Hazard code**
Hazardous to the aquaticenvironment*, **	Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 2 Aquatic Chronic 3 Aquatic Chronic 4	H400 H410 H411 H412 H413
Hazardous to the ozone layer	Ozone	H420
Carcinogenicity***	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity***	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity***	Repr. 1A or 1B Repr. 2 Lact	H360 H361 H362
Acute toxicity****	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3 Acute Tox 4 Acute Tox 4	H300 H310 H330 H301 H311 H331 H312 H332
Specific target organ toxicity, single or repeated exposure****	STOT SE 1 STOT SE 2 STOT RE 1 STOT RE 2	H370 H371 H372 H373
Aspiration hazard****	Asp. Tox. 1	H304

Respiratory or skin sensitisation*****	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317 EUH208 (“Contains <name of sensitising substance>. May produce an allergic reaction.”)

* Products containing peracetic acid and hydrogen peroxide used as bleaching agent may be classified and labelled as H410, H411 or H412, if the classification and labelling are triggered by the presence of these substances.

If the products are subject to show a warning symbol / CLP Pictogram due to legislation, they are not allowed to show the Nordic Swan Ecolabel on the packaging, but only use the following text: Part of an ecolabelled multi-component system. See section "Regulations for the Nordic Ecolabelling of products" for more information.

** Sub-components that are mixed in an automated process in direct connection to the washing machine may be classified and labelled as H412 if the classification and labelling are triggered by enzyme content.

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

**** Products may be classified and labelled as H304, H312, H332, H371 or H373, if the classification and labelling are triggered by the content of oxalic acid, peracetic acid or hydrogen peroxide.

***** Products may be classified and labelled as H317 or H334 if the classification and labelling are triggered by enzyme content. However, this assumes that the enzymes are in liquid form or in solid form as granulates. .

Products labelled with EUH208 (“Contains <name of sensitising substance>. May produce an allergic reaction.”) can be Nordic Swan Ecolabelled only if the sensitising substance is an enzyme. Please note the additional requirement for enzymes in O6.

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

✉ Product label or safety data sheet for the product in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC).

Background to requirement O3

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

Peracetic acid and hydrogen peroxide, are highly reactive, and have the advantage that they bleach at low temperatures. In processes where peracetic acid and hydrogen peroxide are used, laundry can be washed at lower temperatures and thus energy consumption is reduced. Therefore, products containing peracetic acid and hydrogen peroxide used as bleaching agent may be classified and labelled as H410, H411 or H412, if the classification and labelling are triggered by the presence of these substances.

In addition, products may be classified and labelled as H304, H312, H332, H371 or H373, if the classification and labelling are triggered by the content of peracetic acid or hydrogen peroxide.

Products that contain oxalic acid are important for removing stains such as rust, which are often seen on laundry but that cannot be removed in a normal washing process, and there are no obvious alternatives. Therefore, products may also be classified and labelled as H304, H312, H332, H371 or H373, if the classification and labelling are triggered by the content of oxalic acid.

Products may be classified and labelled as H317, H334 or EUH208 if the classification and labelling are triggered by enzyme content. However, this assumes that the enzymes are in liquid form or in solid form as granulates. This reduces the risk of exposure to enzymes in the manufacture of detergent products.

The requirement has changed in relation to generation 3 of the criteria regarding the following: Products that are classified H420, H310 or H311 are no longer allowed. This is to align with the chemical requirements in the recently updated criteria for product groups laundry detergents and stain removers (for consumers) and dishwasher detergents for professional use.

The requirement has been changed in relation to generation 3 of the criteria regarding H420, H310 and H311.

O4 Classification of ingoing substances

Ingoing substances in product must not be classified in accordance with hazard classes described in the table below.

Table 3 Classification of ingoing substances

Classification of chemical products CLP Regulation 1272/2008:		
Hazard statement	**Hazard class and category**	**Hazard code**
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity*	Repr. 1A or 1B Repr. 2 Lact	H360 H361 H362
Respiratory or skin sensitisation**	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317
Endocrine disruption for human health***	ED HH 1 ED HH 2	EUH380 EUH381
Endocrine disruption for the environment***	ED ENV 1 ED ENV 2	EUH430 EUH431
Persistent, Bioaccumulative and Toxic properties*** Very Persistent, Very Bioaccumulative properties***	PBT vPvB	EUH440 EUH441
Persistent, Mobile and Toxic properties Very Persistent, Very Mobile properties	PMT vPvM	EUH450 EUH451

* 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%.

** Enzymes that are in liquid form or in solid form as granulates (including stabilisers in the enzyme raw material) and preservatives may be classified and labelled as H334 or H317. Please note that MI (methylisothiazolinone), CAS no. 2682-20-4 must not be present in the product according to requirement O7.

Note that titanium dioxide in solid mixtures (e.g. in enzymes) is prohibited by this requirement, in effect from 2021-10-01. A transition period until 31 March 2025 applies.

*** See also O7 for additional criteria for potential or identified endocrine disruptors and PBT/vPvB substances

✉ Safety data sheet for all ingoing substances (in all products) in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC).

✉ Completed and signed declaration from the manufacturer of the product (Appendix 2)

✉ Completed and signed declaration from the raw material supplier (Appendix 3)

Background to requirement O4

Excluding carcinogenic, mutagenic, reproduction toxic (CMR) and sensitizing substances is an important parameter from a health perspective. Excluding carcinogenic substances are in this criteria generation also 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. 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 product which is best practice in the industry.

Enzymes and preservatives may be classified and labelled as H334 or H317. Enzymes can improve the efficacy of products at low washing temperatures and thus reduce energy consumption. 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 sensitizing preservatives.

Titanium dioxide: [in powder form containing 1 % or more of particles with aerodynamic diameter ≤ 10 µm] is classified as carcinogen category 2 by inhalation by the 14.ATP of CLP. In addition, the mandatory warning EUH212 is required on the packaging of solid mixtures containing 1 % or more of titanium dioxide. The mandatory EUH212 applies 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) is prohibited. We are aware that the classification is under discussion, but it is valid until otherwise decided.

The Nordic Swan Ecolabel has included the new CLP classifications to align with the European Green Deal's goal of a toxic-free environment. This inclusion reflects the need to establish hazard identification for endocrine disruptors and addresses criteria for environmental toxicity, persistency, mobility, and bioaccumulation. By incorporating these classifications, Nordic Swan Ecolabel ensures that the criteria relate to up-to-date scientific understanding and regulatory compliance. Additionally, the inclusion of PMT and vPvM substances is crucial due to their persistence, mobility, and potential impact on water quality. The Nordic Swan Ecolabel aims for comprehensive hazard identification and protection of the environment and human health.

The requirement has been changed compared with generation 3 of the criteria, regarding including several EUH hazard codes.

O5 Surfactants

All surfactants must be readily biodegradable according to test method No 301 A–F or No 310 in OECD guidelines for testing of chemicals or other equivalent test methods evaluated by an independent body and controlled by Nordic Ecolabelling.

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

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

Background to requirement O5

Surfactants are used in large quantities in laundry detergents for professional use, making the detergents functional and effective. 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. This requirement also excludes linear alkylbenzene sulphonates (LAS) as they are not anaerobically biodegradable.

The requirement is unchanged compared with generation 3 of the criteria.

O6 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.[6]

In cases where enzymes are sub-components in a multi-component system and are mixed in direct connection to the washing machine, the process must be automated and there must be safety measures in place that prevent employees from being exposed to enzymes.

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

[6] https://www.aise.eu/documents/document/20210401175430-a_i_s_e__enzyme_spray_protocol_revision_july_2020.pdf

✉ 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 O6

Enzymes may only be present in the product in liquid form or as granulate capsules, 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[7].

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 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.[8]

The requirement has been changed in relation to generation 3 of the criteria regarding the following:

- The term “granulated capsules” is now used instead of encapsulated. This is because the requirement will otherwise only be interpreted as the enzyme can be covered by polymer (which often is non-degradable).

- Enzymes can now be added to spray products.

O7 Prohibited substances

The following substances are excluded from use in products:

- Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD)
- Benzalkonium chloride, CAS-no. 8001-54-5
- 34 bisphenols[9] that have been identified by ECHA for further EU regulatory risk management that are known or potential endocrine disruptors for the environment or for human health, or that can be identified as toxic for reproduction.
- Boric acid, borates and perborates
- Colourants

[7] https://www.aise.eu/our-activities/standards-and-industry-guidelines/safe-handling-of-enzymes.aspx (accessed 14.01.2019).
[8] https://www.aise.eu/documents/document/20210401175430-a_i_s_e__enzyme_spray_protocol_revision_july_2020.pdf
[9] EC/List No. 201-245-8 (BPA), 201-025-1 (BPB), 401-720-1 (4,4'-Isobutylethylidenediphenol), 216-036-7 (BPAF) and its 8 salts (278-305-5; 425-060-9; 443-330-4; 468-740-0; 469-080-6; 479-100-5; 943-265-6; 947-368-7), 201-250-5 (BPS), 201-240-0 (BPC), 204-279-1 (TBMD), 201-618-5 (6,6'-di-tert-butyl-4,4'-butylidenedi-m-cresol), 242-895-2, 248-607-1, 405-520-5 (D8), 217-121-1 (DAB), 227-033-5 (TMBPA), 210-658-2 (BPF), 411-570-9, 277-962-5 (contains BPS, 500-086-4 (contains BPA), 500-263-6 (contains BPA), 500-607-5 (contains BPA), 701-362-9, 904-653-0 (contains BPA), 908-912-9 (contains BPF), 926-571-4 (contains BPA), 931-252-8 (contains BPA), 941-992-3 (contains BPS), 943-503-9 (contains BPA).

- 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
- Fragrances
- Halogenated flame retardants
- LAS (linear alkylbenzene sulphonates)
- MI (methylisothiazolinone), CAS no. 2682-20-4
- Microplastics
    - *Exemption: Polycarboxylates*

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

  a) Polymerization, 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/-particles are defined according to the EU Commission Recommendation on the Definition of Nanomaterial (2022/C 229/01):

  'Nanomaterial' means a natural, incidental, or manufactured material consisting of solid particles that are present, either on their own or as identifiable constituent particles in aggregates or agglomerates, and where 50 % or more of these particles in the number-based size distribution fulfil at least one of the following conditions:

  (a) one or more external dimensions of the particle are in the size range 1 nm to 100 nm;

  (b) the particle has an elongated shape, such as a rod, fibre or tube, where two external dimensions are smaller than 1 nm and the other dimension is larger than 100 nm;

  (c) the particle has a plate-like shape, where one external dimension is smaller than 1 nm and the other dimensions are larger than 100 nm.
- NTA (nitrilotriacetic acid), CAS-no. 139-13-9 and its salts

  Exemption: 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 final product is below 0.1%.
- Optical brighteners
- Organic chlorine compounds, hypochlorites and hypochlorous acid

  Exemption: Preservatives may contain organic chlorine compounds.
- PFAS (per- and polyfluoroalkyl substances)
- Phosphates

Exemption: Phosphates used to stabilize H_2O_2, are allowed in concentration < 0,0100 w-% in the final product.

- Phtalates

- Potential or identified endocrine disruptors according to any of the EU member state initiative ”Endocrine Disruptor Lists” List I; II; and III.

  o https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu

  o https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption

  o 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.

- Quaternary ammonium compounds, which are not aerobic or anaerobic biodegradable

  According to test method 301 (A-F) or 310 in OECD guidelines for testing of chemicals or other equivalent methods evaluated by an independent body and controlled by Nordic Ecolabelling.

- Siloxanes D4, D5, D6 and HMDS
- Substances categorized as Substances of Very High Concern (SVHC) and included on the Candidate List: https://echa.europa.eu/candidate-list-table.
- 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.
- Triclosan

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

Background to requirement O7

This requirement generally prohibits substances that Nordic Ecolabelling knows or suspects, having negative effects on health and the environment –. Some of the substances are also prohibited in other requirements but are included here for the sake of clarity and to minimize 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 O5.

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".[10] Benzalkonium chloride is also associated with bacterial resistance.[11]

Bisphenols

Several bisphenols with the general bisphenol structure and 'bisphenol derivatives' which have constituents with structural properties common to bisphenols are now prohibited. Based on the potential for widespread use and available information on potential endocrine disruptors, reproductive toxicity and PBT/vPvB properties, 34[12] substances were identified in need for further regulatory risk management in EU[13].

Boric acid, 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 O4.

Colourants

There are a few studies describing problematic health and environmental properties of colorants and since colourants are considered unnecessary for a product's function in this product group, they are excluded from use.

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 and DTPA

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.[14] 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.

[10] https://www.echa.europa.eu/da/web/guest/substance-information/-/substanceinfo/100.058.301 (accessed on August 5, 2021)
[11] Mulder, I. et. al.: Quaternary ammonium compounds in soil: implications for antibiotic resistance development (2017)
[12] Assessment of regulatory needs: Bisphenols. ECHA – 16 December 2021: Section 2.1: Bisphenols for which further EU RRM is proposed – restriction https://echa.europa.eu/documents/10162/c2a8b29d-0e2d-7df8-dac1-2433e2477b02
[13] Annex XV restriction report https://echa.europa.eu/documents/10162/450ca46b-493f-fd0c-afec-c3aea39de487
[14] 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).

Fragrances

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

Halogenated flame retardants

Halogenated flame retardants comprise a range of substances harmful to health and the environment; they are highly toxic to aquatic organisms, carcinogenic or harmful to health in other ways. The substances do not degrade readily in the environment, which increases the risk of harmful effects.

Flame retardants may occur at laundries, since specialist textiles impregnated with flame retardants usually must be re-treated to retain their flame-retardant properties, and this may be done at a laundry. However special impregnating agents such as flame-retardants, are not included in the product group definition.

LAS (Linear alkylbenzene sulphonates)

Linear alkylbenzene sulphonates (LAS) are toxic to aquatic organisms and are not biodegradable in an anaerobic environment.

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

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.[15]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 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. Polycarboxlyates are exempted because this compound is important for alternative complex binders to phosphate to work.

Nanomaterials and nanoparticles

Nanomaterials are a diverse group of materials under the size of 100 nm. Due to their small size and large surface area nanoparticles are often more reactive and may have other properties compared to larger particles of the same material. Further, different sizes, shapes, surface modifications and coatings can also change their physical and chemical properties. Nanoparticles can cross biological membranes and thus be taken up by cells and organs. One of the main concerns

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

are linked to free nanoparticles, as some of these – when inhaled – can reach deep into the lungs, where the uptake into the blood is more likely.

There is concern among public authorities, scientists, environmental organisations, and others about the insufficient knowledge regarding the potential detrimental effects on health and the environment. Nordic Ecolabelling takes these concerns seriously and applies the precautionary principle to exclude potentially hazardous nanomaterials from products.

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%.

Optical brighteners

Optical brighteners make the textiles artificially 'whiter' by lodging in the fibres and reflecting blue light, making the textile look whiter. We know relatively little about the environmental properties of optical brighteners, except that it is not degradable in sludge (not anaerobically degradable). Nordic Ecolabelling has as a general policy that we use the "precautionary principle" – that is, we want to avoid substances that we do not know most of the environmental properties. Optical brighteners are therefore not allowed in Nordic Swan Ecolabelled laundry detergents for professional use.

Organic chlorine compounds, hypochlorites and hypochlorous acid

Organic chlorine compounds, hypochlorites and hypochlorous acid 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. Hypochlorous acid is not classified, and hypochlorites have the classification Acute toxicity (H400) and thus, they are not covered by the general requirement concerning environmentally hazardous substances. However, both pose an environmental risk due to the possibility of organic chlorine compounds forming.

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.[16] 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.[17] 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.[18] To ensure that these PFAS are not introduced in laundry detergents for professional use, Nordic Ecolabelling has chosen to place PFAS on the list of prohibited substances.

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 fertilizer, 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. Except for Morocco, many of these countries are already beginning to run out of extractable phosphorus.[19] Since there are alternatives, Nordic Ecolabelling has chosen to prohibit the use of phosphates. Phosphate refers to salts of phosphoric acid. Phosphates used to stabilize H_2O_2, are allowed in concentration < 0,0100 w-% in the final product. Phthalates

Several phthalates are identified as endocrine disruptors and some of them are classified as reprotoxic. For these reasons several phthalates are included in the Candidate list. Based on their hazardous properties' phthalates pose a threat to the environment and human health and there is a ban on this group of substances.

Potential or identified 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

[16] 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

[17] 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.

[18] 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

[19] 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)

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, harmonized 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 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. 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, 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 prioritized potential EDs which are under evaluation, the Nordic Swan Ecolabel ensures a restrictive policy on EDs.

Quaternary ammonium compounds, which are not aerobic or anaerobic biodegradable

Quaternary ammonium compounds (QACs) are usually surface-active agents where some of them precipitate or denature proteins and destroy micro-organisms. QACs are toxic to a lot of aquatic organisms including fish, daphnids, algae, rotifer and microorganisms employed in wastewater treatment systems.

Siloxanes D4, D5, D6 and HMDS

Siloxanes are a group of substances with molecular weights from a few hundreds to several hundred thousand. Many of them are substances with PBT and/or vPvB properties and gives rise to specific concern based on their potential to

accumulate in the environment. Therefore, siloxanes with known problematic properties are excluded, more specifically D4, D5, D6 and HMDS. Other siloxanes or silicones are not inscribed on the list of substances that are not permitted in the product under requirement O7 but are limited under the requirements concerning CDV (O10) and degradability (O11).

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).[20] Nordic Ecolabelling generally does not want these substances to be used.

Most PBT and vPvB substances are automatically excluded from laundry 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.

SVHC, Substances of Very High Concern and Candidate List

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.

Triclosan

Triclosan is an antibacterial and disinfecting substance that is used in many different products. There is a certain amount of concern that the use of antibacterial and disinfecting substances such as triclosan can play a role in increasing bacterial resistance to antibiotics. Triclosan is regarded as bioaccumulating, although a BCF value below 500 has been documented in some sources. Triclosan has been found in locations, such as in sewage slurry and wastewater from treatment plants, which indicates that the use of triclosan leads to exposure in the environment.

[20] 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

The requirement has been changed in relation to generation 3 of the criteria in terms of the following:

- "Reactive chlorine compounds" has been changed to "organic chlorine compounds, hypochlorites and hypochlorous acid".
- The definition of endocrine disruptors has been updated.
- New substances on the list: Benzalkonium chloride, bisphenols, phosphates, MI (methylisothiazolinone), microplastics, NTA and colorants.

O8 Certified raw materials

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.

Sugarcane must be certified to Bonsucro standard (EU REDII approved), version 5.1 or later version.

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, palm oil/palm kernel oil derivatives or sugarcane 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.

✉ Valid Bonsucro EU-RED Chain of Custody certificate from the supplier/or link to valid certificate on Bonsucro certificate database covering all sugar cane used in the Nordic Swan Ecolabelled product.

✉ Documentation showing that the quantity of Bonsucro EU-RED certified sugar cane is met. This should be specified in e.g. invoices or delivery notes according to Bonsucro EU-RED requirements for Chain of Custody.

Background to requirement O8

Regarding renewable raw materials, special attention is paid to palm oil and sugarcane. One way to reduce the negative effects of the increasing use of palm oil products, e.g. rain forest destruction and unsustainable farming, is to increase the proportion of certified sustainable crops. Requirement to Code of conduct have been assessed. Such a requirement will not provide further improvement in this product group as it is primarily palm oil that is used (and must then be certified).

Sugar cane is not currently associated as strongly with the problems of rainforest destruction mentioned above as palm oil are, but there can also be challenges linked to its production. Over the period 1960–2008, the land used for sugar cane cultivation rose from 1.4 to 9 Mha. Around 65% of newly planted sugar cane is grown on plains (grasslands and savannahs) and the remainder comprises areas previously used for other types of farming. However, as demand for sugar cane as

a raw material rises, opportunities to expand the production areas are being explored. A loss of biodiversity in the rainforest may therefore become a problem associated with sugar cane in the future. At this point in time, the Cerrado is under the greatest pressure from the sugar cane industry. The Cerrado is a tropical savannah in Brazil that has unique biodiversity and specific ecosystems that are under threat.[21] Nordic Ecolabelling therefore only allow sugarcane that is certified to Bonsucro standard (EU REDll approved), version 5.1 or later version.

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 in generation 4 of the criteria.

3.4 Total content of environmentally harmful substances

The requirements in this chapter apply to complete laundry detergents or the total quantity of wash chemicals in multi-component systems that are used to wash 1 kg of laundry (g/kg laundry). The requirements are based on the highest recommended dosing per degree of soiling stated on the product label or accompanying product sheet. The table below shows a common division of laundry categories according to degree of soiling.

Table 4 Examples of laundry categories according to degree of soiling

Light soiling	Medium soiling	Heavy soiling
Bedlinen and towels from hotels and other overnight accommodation establishments Duvets and pillows Mats Cloth hand towel rolls	Work clothes Institution/trade/service Laundry from hospitals and nursing homes and similar institutions, e.g. bedding, mattress covers, operation sheets, barrier sheets, and patient clothing. Mops	Work clothes Industry/kitchen/ butchering and equivalent use Kitchen equipment Clothes and towels Industry clothing Restaurant Cloths/napkins and similar for use in restaurants, industrial kitchens, etc.

O9 CDV

The critical dilution volume (CDV) of the laundry detergent or the multi-component system may not exceed the following limit values.

Table 5 Limit values for $CDV_{chronic}$

Degree of soiling	$CDV_{chronic}$ (litres/kg laundry)
Light	10 000
Medium	18 000
Heavy	28 000

The calculation of the CDV-value must be based on the highest recommended dosing stated on the product label or accompanying product sheet per degree of soiling.

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

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

21 http://www.wwf.dk/wwfs_arbejde/skov/soja/skovomrader/cerrado/

dosei = the input quantity of the indiviual substance in g/kg laundry

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.

Because of the degradation of the substances in the wash process, separate rules apply for the following two substances:

- Hydrogen peroxide (H2O2) is not to be included in calculation of CDV.
- Peracetic acid (CH3CO3H) is to be included in the calculation as acetic acid.

☒ 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 O9

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 4. 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 limit values have been set on the basis of licence data.

The properties in relation to environmental damage and degradability are covered by the strict CDV limits in this product group. The requirement for long-term environmental effects are therefore removed.

The requirement has been changed with generation 3 of the criteria in terms of the following:

- Only chronic values are given for the CDV limit.
- The limit values have been tightened up.
- The link to washing temperature is removed.

O10 Biodegradability – aerobic and anaerobic (aNBO and anNBO)

The total content of organic substances that are either not aerobically or anaerobically biodegradable in the laundry detergent or the multi-component system must not exceed the following limit values stated.

Table 6 Limit values for aNBO and anNBO

Degree of soiling	aNBO (g/kg Laundry)	anNBO (g/kg laundry)
Light	0,40	0,40
Medium	0,70	0,70
Heavy	1,00	1,00

The calculation must be based on the highest recommended dosing stated on the product label or accompanying product sheet per 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 O5.

See also the exemption from the requirement of anaerobic biodegradability for substances which are not surfactants (Appendix 4, item 7, 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 O10

The requirement cuts the amount of non-biodegradable substances in laundry detergents for professional use to a minimal level. This reduces the potential accumulation of non-readily biodegradable and non-anaerobically 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. Cumene sulfonates is excluded because it meets the conditions for exemption according to Appendix 4, section 7. It is included in the requirement as a clarification.

Polycarboxylate are excluded from the calculation of aNBO and anNBO, because this compound is important for alternative complex binders to phosphate to work well.

The requirement is stricter compared with generation 3 of the criteria.

O11 Phosphonates/phosphonic acid

Total phosphonates/phosphonic acid in the laundry detergent or the multi-component system may not exceed the following limit values.

Table 7 Limit values for content of phosphonates/phosphonic acids

Degree of soiling	Phosphonates/phosphonic acids (g/kg laundry)
Light	0,075
Medium	0,10
Heavy	0,15

✉ Calculation of total quantity of phosphonates/phosphonic acids, expressed as g/kg laundry.

Background to requirement O11

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 stabilize bleaching agents that are a good alternative to hypochlorite. Nordic Ecolabelling has therefore chosen to permit the use of phosphonates and phosphonic acids, but only in very limited quantities. The limit values are based on license data.

The A and B system in generation 3 is removed. In this generation, all products must meet the toughest limit values, which means that the requirement is stricter for some products and unchanged for others.

3.5 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, and label). Only the packaging types described in requirement O12-O16 can currently be used. Bag-in-box packaging must meet the requirements for flexible plastic bags (O14) and rigid plastic packaging (O12) or paper-based packaging (O15) depending on the material of the box.

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

O12 Rigid plastic packaging: Design for recycling

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

Products delivered in a plastic package that is part for a take-back system are exempt from the requirement. Instead requirement O16 Reuse of packaging must be fulfilled.

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 O15 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: *Coloured PP packaging components may have up to 5% PE if they come from the masterbatch.*

Membranes, oblates and seals may be made of thermoplastic elastomer (TPE) based on styrene-ethylene-butylene-styrene thermoplastic elastomer (SEBS), expanded polyethylene (EPE), 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 O12

The waste stage is influenced by many factors, such as sorting opportunities in each country or municipality, and how the professional user 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[22] that has a clear focus on recovery and recycling, particularly with regards to packaging material. EU has also accepted a plastic strategy[23] 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

[22] 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

[23] 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)

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

The Nordic recycling manuals for plastic packaging[24] 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.

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 laundry detergents. Many conveyors use automatic machine sorting where packages are handled very harshly. Therefore, 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).

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 they 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[25, 26]. 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

[24] "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/2018/06/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);

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

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 in generation 4.

O13 Labels for rigid plastic packaging: Design for recycling

Labels on packages smaller than 20 litres must have a design that enables material recovery.

Products covered by rules for dangerous goods are exempted this requirement.

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[27].
  - Paper labels without fibre loss. The suitability must be substantiated in accordance with Recyclass' Washing quick test procedure: For paper labels applied on HDPE & PP containers, standard laboratory practice, version 1.0[28].
- Containers in polyethylene terephthalate (PET) must have a label 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 1.0,[29].

  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

[27] https://recyclass.eu/wp-content/uploads/2022/04/RecyClass-Washing-QT-Procedure-for-Film-Labels-applied-on-HDPE-and-PP-Containers-v1.1.pdf (Accessed on 2021-06-23).
[28] https://recyclass.eu/wp-content/uploads/2022/04/RecyClass-Washing-QT-Procedure-for-Film-Labels-applied-on-HDPE-and-PP-Containers-v1.1.pdf (Accessed on 2021-06-11).
[29] https://recyclass.eu/wp-content/uploads/2022/04/RecyClass-Washing-QT-Procedure-for-Film-Labels-applied-on-HDPE-and-PP-Containers-v1.1.pdf (Accessed on 2021-06-11).

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.

✉ 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 O13

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 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. In order 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). As a consequence, for the time being, cPET labels are not allowed. Nordic Ecolabelling will consider to allow cPET-labels with the appropriate specifications, if cPET labels become endorsed by EPBP (The European PET Bottle Platform) for PET bottles and/or by RecyClass (www.recyclass.eu). LD-PET may be used (density <1.0 g/ml). 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 in order 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[30]. 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 Radio Frequency Identification Technology (RFID) technology is exempt from the requirement though because RFID labels enable traceability of products and can contribute to reduced wastage.

Seen in relation to the recycling process in isolation, the label requirement is also desired for volumes over 20 litres. But for packaging larger than 20 litres, the label proportion in terms of weight is assumed to be far lower than for smaller packaging, as such large packaging has thick-walled plastic[31]. Thus, the recycling process is affected to a far lesser extent and the label's impact is less critical.

In addition, the laundry detergents for professional use are often covered by rules for dangerous goods, and these rules will trump design for recycling guidelines. These rules entails the need for labels of bigger size. Furthermore, the demand for information in several languages, are also challenging for volumes under 20 litres. Therefore products classified as dangerous goods are exempted.

The requirement is new in generation 4.

O14 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.

[30] https://www.epbp.org/design-guidelines/products (Accessed on 2021-01-04).
[31] Kommunikasjon med Plastretur 3.5.2023

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 intended for products covered by the ADR Regulation may contain multimaterials of PE, PP, PET and/or PA for a transitional period until 31 December 2023.

- 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.
- 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 O14

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 if they are to meet the requirements for UN labelling. Therefore, flexible plastic bags intended for detergents according to the ADR Regulation may consist of multimaterials of PE, PP, PET and/or PA for a transitional period until 2023-12-31.

The requirement is new in generation 4.

O15 Paper-based packaging: Design for recycling

Cardboard packaging

- Cardboard packaging must contain at least 90% paper/paperboard.

- The wood raw 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).

  Exception: Metal rivets for attaching plastic handles to heavier cardboard packaging (> 4.5 kg) for powder detergents.
- Paper labels are permitted. Other types of labels are not permitted. The label glue must be water soluble.
- 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 50% 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.
- Coloured corrugated board packaging 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 O15

Legislation and infrastructure are in place for paper-/cardboard collection and recycling in the Nordic countries[32]. To promote the use of recycled materials and to save virgin resources, an obligatory requirement on the amount of recycled materials for corrugated board packaging is introduced. For cardboard packaging there are currently no or very low availability of recycled material that would be strong enough for larger professional product packaging.

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. However, a significant proportion of the Nordic board waste is currently not sent to such specialised facilities[33].

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[34].

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 in generation 4.

O16 Reuse of packaging

[32] http://norden.diva-portal.org/smash/get/diva2:1304371/FULLTEXT01.pdf Accessed on 2020-12-08.
[33] Personal communication with Johannes Daae, Grønt Punkt Norge (January 2021).
[34] Personal communication with Cecilia Halling Linder, Fiskeby Board AB (December 2020).

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.

Primary packaging less than 200 litres must also fulfil this requirement, if they do not fulfil O12.

✉ 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 O16

Laundry 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 in 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, such as Noreko in Norway, Sweden and to some extent in Denmark, who contribute to reuse of containers from 120 litre and more[35] 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 in generation 4.

O17 User information

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

- That the product only is intended for professional users and/or large-scale consumers.
- The product's area of use.
- Washing temperature and dosing in accordance with the information stated in requirement O1.
- 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.*

✉ Copy of label and/or product sheet.

Background to requirement O17

[35] Communication with Noreko 3.5.2023

To avoid that professional products are being sold to consumers in grocery stores, it must be stated on the product's label or accompanying product sheet that the product only is intended for professional users and/or large-scale consumers.

Information about the product's area of use, washing temperature and dosing aims for correct use of the product, which affect the total environmental burden of the product.

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 has been changed in relation to generation 3 of the criteria regarding the following:

- Information about that the product only is intended for professional users and/or large-scale consumers.
- Information about recycling of plastic packaging is new.

3.6 Performance

O18 Washing efficiency

The laundry detergent or the multi-component system must be satisfactory efficient at the recommended washing temperature and dosage in soft water.

The efficiency of the laundry detergent or the multi-component system must be documented in the form of a user test that meets the requirements below:

1. If the application relates to a multi-component system, all the sub-components must be included in the test.
2. At least five independent professional users must test the product under relevant conditions.
3. The product must be tested at the recommended washing temperature* and dosage on the packaging label or accompanying product sheet. If the dosing is stated in intervals for each separate degree of soiling, the worst-case dosing, i.e. the lowest dosing or lower, must be used.
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.

** Note that only products that are effective from 40°C or lower for light and medium soiling and 60°C or lower for heavy soiling can be Nordic Swan Ecolabelled.*

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

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

Background to requirement O18

Documentation of performance is crucial for the credibility of the Nordic Swan Ecolabel. It is also important from a circular economy perspective. Efficient

products reduce the risk of re-laundering, ensure efficient use of resources, and can extend the lifespan of the textiles.

The requirement is clarified in relation to generation 3 of the criteria. The option to conduct only three user tests is removed.

3.7 Licence maintenance

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

O19 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 O19

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.

The requirement is unchanged compared with generation 3 of the criteria.

O20 Traceability

The licensee must be able to trace the Nordic Swan Ecolabelled products in the production. A manufactured / sold product should be able to trace back to the occasion (time and date) and the location (specific factory) and, in relevant cases, also which machine / production line where 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 O20

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.

The requirement is unchanged compared with generation 3 of the criteria.

4 Changes compared to previous generation

The table below shows the changes to criteria for laundry detergents generation 4 compared with previous generation 3.

Table 8 Overview of changes

Requirement generation 4	Requirement generation 3	Same req.	Change	New req.	Comment
O1 Description of the product	O1		X		The A and B system is removed. Instead, only products that are effective from 40°C or lower for light and medium soiling and 60°C or lower for heavy soiling can be Nordic Swan Ecolabelled.
O2 Formulation	O2	X			
O3 Classification of the product	O3		X		Products that are classified H420, H310 or H311 are no longer allowed
O4 Classification of ingoing substances	O4		X		Also inclution of new hazard classes from CLP
O5 Surfactants	O5	X			
O6 Enzymes	O6		X		The term “granulated capsules” is now used instead of encapsulated. 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
O7 Prohibited substances	O7		X		“Reactive chlorine compounds” has been changed to “organic chlorine compounds, hypochlorites and hypochlorous acid”. The definition of endocrine disruptors has been updated. New substances on the list: Benzalkonium chloride, bisphenols, phosphates, MI (methylisothiazolinone), microplastics, NTA and colorants
O8 Certified raw materials				X	Palm oil, palm kernel oil and derivatives of palm oil or palm kernel oil must have RSPO certification. Sugarcane must be certified to Bonsucro standard (EU REDII approved), version 5.1 or later version.
O9 CDV	O13		X		Only chronic values are given for the CDV limit. The limit values have been tightened up. The link to washing temperature are removed.

O10 Biodegradability – aerobic and anaerobic (aNBO and anNBO)	O14 and O15		X		The limit values have been tightened.
O11Phosphonates/phosphonic acid	O17 Phosphonate/ phosphonic acid		X		The A and B system is removed. Instead, all products must meet the toughest limit values, which means that the requirement is stricter for some products and unchanged for others.
	O18 Long-term environmental effects		X		The requirement has been removed
O12 Rigid plastic packaging: Design for recycling				X	Requirements concerning design for recycling.
O13 Labels for rigid plastic packaging: Design for recycling				X	Requirements concerning design for recycling.
O14 Flexible plastic pouches: Design for recycling				X	Requirements concerning design for recycling.
O15 Paper-based packaging: Design for recycling				X	Requirements concerning design for recycling.
O16 Reuse of packaging				X	Reuse of packaging that is 200 litres or larger.
O17 User information	O12		X		Information about that the product only is intended for professional users and/or large-scale consumers is new. Information about recycling of plastic packaging is new.
O18 Washing efficiency	O19		X		The requirement is clarified in relation to generation 3 of the criteria. The option to conduct only three user tests is removed.
	O20 Efficiency of chemical disinfection				The requirement has been removed
O19 Customer complaints	O25	X			
O20 Traceability	O28	X			