About Nordic Swan Ecolabelled

Dishwasher detergents and rinse aids

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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:

Denmark
Ecolabelling Denmark
www.svanemaerket.dk

Finland
Ecolabelling Finland
https://joutsenmerkki.fi/

Sweden
Ecolabelling Sweden
www.svanen.se

Iceland
Ecolabelling Iceland
www.svanurinn.is

Norway
Ecolabelling Norway
www.svanemerket.no

1 Environmental impact of dishwasher detergents and rinse aids

A MECO* analysis, which looks at the combined impact of materials, energy, chemicals and other (such as waste, distribution and so on), conducted by the Nordic Ecolabelling in 2011 showed that:

- Energy in the usage phase stands out as the largest parameter. The second-biggest parameter is energy from raw material production.
- The analysis also revealed that the distribution of packaging has a greater energy impact than the energy impact of the packaging itself.

**MECO might be described as a "light version" of an LCA (Life Cycle Analysis) that weighs up the various parameters. There is no numerical factor for the environmental or health impact of the ingredients in the MECO.*

The results from the MECO are largely in line with the outcome of the generic LCA as cited in A.I.S.E.'s ASP substantiation dossier[1] and the main environmental hotspots for dishwasher detergents which are highlighted in JRC Technical report[2].

The inherent properties of the chemicals are not weighted in the MECO analysis, i.e. there is no weighting for the properties of the constituent substances in terms of energy consumption during use, packaging etc. The inherent properties of the ingredients do however remain an important target for requirements since they end up in the wastewater system.

Energy in the use phase is directly targeted in the criteria by the efficiency requirement at low washing temperature of 45°C, as well as by a mandatory washing guidance on the packaging, encouraging a sustainable dishwashing procedure. There are currently no requirements on energy from the raw material production, as this is difficult to influence for the Nordic Ecolabelling at the time being.

Distribution of packaging is targeted by requirements to fill ratio and to the weight-utility ratio, which together steer towards well-filled, light-weight packaging and concentrated products.

It is also considered relevant to set ambitious packaging requirements that support recycling and circular economy. This is due to the large amounts of

[1] A.I.S.E Charter for sustainable cleaning 2020+. ASP substantiation dossier household automativ dishwashing detergents (1st revis) Version 1.0 (1 July 2019) https://www.sustainable-cleaning2020.com/LIBRARY-Documentation/Sustainability-Product-Standards/20190701_Charter2020_ASP_Automatic_Dishwash_Detergents.zip?force_download=true (accessed on 2020-11-04)
[2] Revision of six EU Ecolabel Criteria for detergents and cleaning products (2016). https://susproc.jrc.ec.europa.eu/product-bureau//sites/default/files/contentype/product_group_documents/1581681262/Technical%20background%20report.pdf (accessed on 2020-11-04)

packaging used and in line with the circular economy action plan adopted in the EU[3].

Dosing and performance affect all stages of the life cycle and are therefore included as relevant areas in the criteria.

Nordic Swan Ecolabelled Dishwasher detergents and rinse aids contribute to several of the UN Sustainable Development Goals, in particular goal 12 on responsible consumption and production. The products have a reduced impact from production, use and recycling:

- Requirements on sustainable use of palm oil contributes to achieve sustainable management and efficient use of natural resources (12.2).
- Chemical requirements on e.g. biodegradability and ecotoxicity ensure minimal release to recipient water bodies from dishwashing (12.4).
- Phasing out substances that are hazardous to health and the environment in products and manufacturing helps to prevent both users and factory workers from being exposed to harmful chemicals – and to reduce contamination of air, water and soil in order to minimize their adverse impact on human health and the environment (12.4).
- Promoting use of recycled plastics and cardboard in packaging reduce waste and use of new resources (12.5).
- Requirements on packaging design for recycling allow the materials to be recycled (12.5).

The strict requirements on chemicals are also a contribution to UN SDG 3 of good health and well-being, to substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination (3.9).

In addition, UN SDG 13 climate action is targeted by the requirement that dishwasher detergents must be effective at "low washing temperature" of 45ºC, which promotes lower energy use per wash.

Requirements on use of certified palm oil also targets UN SDG 15 life on land.

For more information on how the Nordic Swan Ecolabel contributes to the UN Sustainable Development Goals, please see The Nordic Swan Ecolabel and the UN Sustainable Development Goals[4].

2 Justification of the requirements

This chapter presents the new and revised requirements for the product group, and explains the background to the requirements, the chosen requirement levels

[3] 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/legalcontent/EN/TXT/?uri=CELEX%3A52015DC0614

[4] http://www.nordic-ecolabel.org/contentassets/18f43073b84948ea87997d4e82ed3b24/nordic_swan_un_sustainability.pdf (Accessed 2020-05-11).

and any changes compared with generation 6. The appendices referred to are those that appear in the criteria document “Nordic Ecolabelling for Dishwasher detergents and rinse aids".

2.1 Definition of the product group

The product group Dishwasher detergents and rinse aids relates to dishwasher detergents and rinse aids for household machines. The rinse aid may be integrated into the product or it may be a separate product.

Dishwasher detergents for professional use in institutional and large-scale kitchens or for instrument cleaning in healthcare cannot be labelled under these criteria. See the Nordic Swan Ecolabel criteria for dishwasher detergents for professional use instead.

Cleaning agents for dishwashers was investigated during Nordic Ecolabelling's evaluation of criteria generation 6 in the spring of 2020. It was found that the potential for the Nordic Swan Ecolabel to make an environmental difference within this product segment is too limited. Hence, we decided not to include cleaning agents for dishwashers in the criteria.

2.2 General requirements

The requirements in the criteria document and accompanying appendices apply to all ingoing substances in the Nordic Swan Ecolabelled product. Impurities are not regarded as ingoing substances and are exempted 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 in the Nordic Swan Ecolabelled product in concentrations less than 100 ppm (0.0100 w-%, 100 mg/kg) in the Nordic Swan Ecolabelled product.
- Impurities in the raw materials exceeding concentrations of 1.0% are always regarded as ingoing substances, regardless of the concentration in the Nordic Swan Ecolabelled product.

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

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

O1 Description of the product

The applicant must give detailed information on the dishwasher detergent or rinse aid to which the application relates. The following information is required:

- Description of the product
- A complete formulation for the product. The formulation must for each ingoing raw material include:
  a) Trade name
  b) Chemical name for the main component, and, if relevant, additives (e.g. colourants, preservatives and stabilizers)
  c) Amount (both with and without solvents, e.g. water)
  d) CAS No / EC No
  e) Function
  f) DID No for substances that can be placed in the DID list
- A safety data sheet for each ingoing raw material

The DID number is an ingredient's number on the DID list, which is used in calculating chemical requirements. The DID list can be obtained from https://www.nordic-swan-ecolabel.org/criteria/dishwasher-detergents-and-rinse-aids-017/ or Nordic Ecolabelling's national websites, see contact info first in this document.

✉ Description of the product, e.g. label and product data sheet (if available). The information on labels and/or product data sheets must be in the languages in which the product is marketed.

✉ A complete formulation/recipe of the product with information as set out in the requirement. Nordic Ecolabelling's calculation sheet can be used and can be obtained from https://www.nordic-swan-ecolabel.org/criteria/dishwasher-detergents-and-rinse-aids-017/ or Nordic Ecolabelling's national websites.

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

Background to requirement O1

A description of the product (e.g. label) and its areas of use is required in order to assess whether the product falls within the product group definition.

Nordic Ecolabelling needs to know the complete formulation, with all ingoing raw materials. This is necessary in order to control the individual requirements below and make the calculations necessary in respect of each requirement.

The requirement has been adjusted slightly compared with the previous generation of the criteria and is now in line with other newer criteria for cleaning products and detergents.

O2 Classification of the product

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

Table Classification of the product

CLP Regulation 1272/2008		
Classification	**Hazard Class and Category Code**	**Hazard statement**
Hazardous to the aquatic environment	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 Acute Tox 4	H300 H310 H330 H301 H311 H331 H302 H312 H332
Aspiration toxicity	Asp Tox 1	H304
Specific target organ toxicity, single or repeated exposure	STOT SE 1 STOT SE 2 STOT RE 1 STOT RE 2	H370 H371 H372 H373
Skin corrosion/irritation	Skin Corr. 1A, 1B or 1C	H314
Aspiration hazard	Asp. Tox. 1	H304
Respiratory or skin sensitisation**	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317

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

** 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. Ref exemption of H317- and H334-classifications for enzymes in requirement O4 Classification of ingoing substances.

Please note the additional requirement for enzymes in O8.

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 O2

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

By including requirements stating that substances categorised by specific inherent properties must not be used, the ecolabelling can meet concerns regarding safe use of specific chemicals and thus highlight environmental and/or consumer issues.

The ban on H420 (Hazardous to the ozone layer) has been introduced in this generation. Nordic Ecolabelling does not believe there is a risk of products with H420 entering the market but has chosen to introduce the requirement to emphasise that no environmental hazard classification is permitted.

CMR substances are excluded already at a raw material level. For communication reasons the ban has also been included at product level in this generation.

Nordic Ecolabelling wishes to minimise the amounts of sensitising/allergenic substances in the products, to reduce the risk of sensitization and allergic reactions to already sensitized persons. Most sensitizing substances are excluded already at a raw material level. A restriction on EUH208 (“Contains <name of sensitising substance>. May produce an allergic reaction”) has been introduced to increase the consumer protection against sensitizing substances. This is in line with the requirements for Nordic Swan Ecolabelling of laundry detergents and stain removers (generations 8). In those criteria, an exemption is made to enzymes in products that are primarily used in closed systems. Enzymes are exempted also in these criteria for Dishwasher detergents and rinse aids. The products are used in closed systems, and enzymes are crucial for the product performance.

2.3 Requirements for ingoing substances

O3 Certified raw materials from oil palms

Palm oil, palm kernel oil and palm oil/palm kernel oil derivatives must be certified according to RSPO. Mass Balance, Segregated or Identity Preserved are accepted as traceability systems.

The requirement does not include raw materials < 1.0% in the final product.

✉ Information from the raw material producer whether palm oil, palm kernel oil or derivatives of these are included in the raw material. Appendix 3 can be used.

✉ A valid RSPO Supply Chain certificate from raw material manufacturer/ supplier.

✉ The manufacturer of the Nordic Swan Ecolabelled product must be able to show by raw material supplier’s invoices/delivery notes that the palm oil purchased is certified and information about traceability system (Mass Balance, Segregated or Identity Preserved accepted). The documentation must be shown when requested by Nordic Ecolabelling, e.g. during licence application, on-site inspections or other follow-up inspections.

Background to requirement O3

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

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

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

Certification requirement is not set for other renewable raw materials since they are either less relevant in these products (soy or sugar) or there are not yet sustainability standards (coconut).

This is a new requirement for dishwasher detergents and rinse aids. The requirement is the same as for generation 6 for hand dishwash detergents, generation 6 for cleaning products and generation 8 for laundry detergents and stain removers.

O4 Classification of ingoing substances

Ingoing substances in the product must not be classified with any of the hazard classes stated in Table O4.

Table O4 Classification of ingoing substances

CLP Regulation 1272/2008:		
Classification	**Hazard Class and Category Code**	**Hazard statement**
Carcinogenic*	Carc. 1A or 1B Carc. 2	H350 H351**
Mutagenic*	Muta. 1A or 1B Muta. 2	H340 H341
Toxic for reproduction*	Repr. 1A or 1B Repr. 2 Lact	H360 H361 H362
Respiratory or skin sensitisation***	Resp. Sens. 1 Skin Sens. 1	H334 H317

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

** MGDA (methylglycinediacetic acid) and GLDA (N,N-dicarboxymethyl glutamic acid) type complexing agents may contain NTA (nitrilotriacetic acid) impurities in the raw material in concentrations of less than 0.2%, if the concentration of NTA in the end product is below 0.1%.

*** The following substances are exempt:

- Enzymes, including stabilisers in the enzyme raw material.

Please note the additional requirement for enzymes in O8.

- Stabilisers and preservatives in colours.
- Fragrances.

Please note the additional requirement for fragrances in O7.

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

☒ Appendix 2 and 3 or equivalent certification completed and signed.

Background to requirement O4

By stating that substances categorized by specific inherent properties must not be used in Nordic Swan Ecolabelled products, the Nordic ecolabelling can meet concerns regarding safe use of specific chemicals and thus highlight environmental and/or consumer issues and concerns.

Complexing agents are considered necessary for the performance. MGDA and GLDA complexing agents contain NTA (classified with H351) as residues from raw material production. The impurity limit has been reduced from criteria generation 6, to take the reduced impurity levels in today's raw materials into account.[5]

Enzymes are exempted from this requirement because they are considered necessary for the performance and because all enzymes are classified as sensitising. There are no alternatives to the classified options. Please note the separate requirement on enzymes. Fragrances are similarly exempted from this requirement. Please note the separate requirement on fragrances.

Stabilizers and preservatives in colours are exempt because of the susceptibility to microbiological growth in some waterborne colourants. Note that the levels are limited by the prohibition of product labelling with the statement EUH208 (ref. requirement on product classification). Please note the separate requirement on colours.

Titanium dioxide: [in powder form containing 1 % or more of particles with aerodynamic diameter ≤ 10 µm] was classified as Carc. 2 by inhalation by the 14. ATP of CLP. In addition, the mandatory warning EUH212 was required on the packaging of solid mixtures containing 1 % or more of titanium dioxide. The mandatory EUH212 applied regardless of titanium dioxide particle size, implying that particles with aerodynamic diameter ≤ 10 µm may be released from any solid mixture containing titanium dioxide when used. These particles, "known to be released from ingoing substances" are counted as ingoing substances according to Nordic Ecolabelling's definition (cf. "General requirements" in the criteria document). Accordingly, all titanium dioxide occurring in solid mixtures (regardless of size) was prohibited. There has been a time limited exemption to this prohibition, which ran out in March 2025. In August 2025, the EU Court of Justice made a final decision to annul the Carc. 2 classification, meaning that titanium dioxide is no longer prohibited by this requirement. However, see requirement O5 where titanium dioxide as a nanomaterial is prohibited.

The generation 6 requirements O3 CMR substances and O4 Sensitizing substances have been merged into one requirement.

O5 Prohibited substances

The following substances must not be present in the product:

- Alkylphenol ethoxylates (APEO) and otheralkylphenol derivatives (APD)

[5] Revision of six EU Ecolabel Criteria for detergents and cleaning products (2016). https://susproc.jrc.ec.europa.eu/product-bureau//sites/default/files/contentype/product_group_documents/1581681262/Technical%20background%20report.pdf (accessed on 2020-11-04)

- EDTA (Ethylene diamine tetraacetate and its salts) and DTPA (Diethylenetriamine pentaacetate)
- Linear alkylbenzene sulphonates (LAS)
- Nitro musks and polycyclic musk compounds
- Per- and polyfluoroalkyl substances (PFAS)
- Phosphates
- Antimicrobial or disinfecting ingredients added for other purposes than preservation
- Organochlorine compounds and hypochlorite. The prohibition of organochlorine compounds does not encompass preservatives.
- Methylisothiazolinone (MI, CAS 26823-20-4)
- Microplastics

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

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

> *a) are contained in particles and constitute at least 1% by weight of those particles; or build a continuous surface coating on particles.*
>
> *b) at least 1% by weight of the particles referred to in point (a) fulfil either of the following conditions:*
>
> > *(i) all dimensions of the particles are equal to or less than 5 mm.*
> >
> > *(ii) the length of the particles is equal to or less than 15 mm and their length to diameter ratio is greater than 3.*

The following polymers are excluded from this designation:

> *a) polymers that are the result of a polymerisation process that has taken place in nature, independently of the process through which they have been extracted, which are not chemically modified substances.*
>
> *b) polymers that are biodegradable as proved in accordance with Appendix 15 [to REACH, Regulation (EC) No 1907/2006].*
>
> *c) polymers that have a solubility greater than 2 g/L as proved in accordance with Appendix 16 [to REACH, Regulation (EC) No 1907/2006].*
>
> *d) polymers that do not contain carbon atoms in their chemical structure.*

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

Old definition: Microplastic means particles with a size of below 5 mm of insoluble macromolecular plastic, obtained through one of the following processes:

(a) a polymerisation process such as polyaddition or polycondensation or a similar process using monomers or other starting substances;
(b) chemical modification of natural or synthetic macromolecules;
(c) microbial fermentation.

Please note that Nordic Ecolabelling is following the development of ECHA's restriction proposal and its definition and reserve the right to change the definition above when the definition used in the restriction proposal is finalized. An appropriate transition period would be granted.

- Nanomaterials

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

- Substances judged to be "Substances of very high concern", which are included on the Candidate List: http://echa.europa.eu/candidate-list-table.
- Potential or identified endocrine disruptors according to any of the EU member state initiative "Endocrine Disruptor Lists" List I; II; and III.

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

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

https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities

A substance which is transferred to one of the corresponding sublists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sublist II which were evaluated under the Cosmetics Regulation. Nordic Ecolabelling will evaluate the circumstances on a case-by-case basis."

- Substances evaluated by 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 and substances that have not yet been investigated, but which meet these criteria.

✉ Appendix 2 and 3 or equivalent certification completed and signed.

Background to requirement O5

There are several problematic substances that are difficult to exclude through general requirements concerning the product's chemistry. Nordic Ecolabelling has compiled a list of the substances that must not be added to products. The aim of the list is to prohibit substances that are not excluded from use via other requirements, but that are associated with environmental and health risks. Some substances are included in the list for the sake of clarity, even though they are prohibited under other requirements. There are also double requirements in the list below. For example, certain perfluorinated substances are also SVHC substances.

APEO

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

The requirement is the same as in generation 6.

EDTA and DTPA

EDTA (Ethylenediaminetetraacetic acid) and its salts are not readily degradable and at municipal water treatment plants EDTA is either not degraded or only slightly degraded EU[6]. Today there are more environmentally aware alternatives that are degradable and that can replace EDTA. DTPA has the similar properties to EDTA.

The requirement is the same as in generation 6.

Linear alkylbenzene sulphonates

The group of linear alkylbenzene sulphonates (LAS) is on the Danish EPA's list of unwanted substances and it is also one of the xenobiotic substances in sludge which the WWTP's must report to the Danish EPA each year[7]. LAS is hazardous to the aquatic environment and not anaerobically biodegradable according to the DID-list. These substances are also excluded from use under the surfactants requirement.

The requirement is the same as in generation 6.

Nitro musks and polycyclic musk compounds

Nitro musks and polycyclic musks generally have undesirable properties regarding both health and the environment. Some such compounds are already excluded through the exclusion of CMR substances. The use of nitro musks is extremely limited, but manufacturers outside Europe still produce substances such as Musk ambrette that are prohibited under IFRA. Excluding nitro and polycyclic musks therefore remains relevant as a preventive measure.

The requirement is the same as in generation 6.

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

[6] European Union (2004). Risk Assessment Tetrasodium Ethylenediaminetetraacetate, Final Report. https://echa.europa.eu/documents/10162/415c121b-12cd-40a2-bd56-812c57c303ce (Accessed on 2020-09-11).
[7] Kortlægning af LAS. Kortlægning af kemiske stoffer I forbrugerprodukter, nr 87 2007. https://www2.mst.dk/Udgiv/publikationer/2007/978-87-7052-634-0/pdf/978-87-7052-635-7.pdf (Accessed on 2020-11-10).

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.[8] 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.[9] 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.[10] To ensure that these PCFs are not introduced in dishwasher detergents or rinse aids, Nordic Ecolabelling has chosen to place PFCs on the list of prohibited substances.

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

Phosphates

See background to requirement O6 Phosphorous. Phosphates have been added to the list of prohibited substances to ascertain that there will not be any conflicts between phosphorous levels in Nordic Swan Ecolabelled products, as regulated in requirement O6 Phosphorous, and the Swedish regulation 2010:267.

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

Antimicrobial/disinfecting agents (for other purposes than preservation)

Due to their mode of action, substances with disinfecting or antimicrobial properties generally have a high aquatic toxicity and are often poorly biodegradable due to inhibitory effects on bacteria. Use of antimicrobials and disinfecting agents should also generally be reduced in relation to the possible development of resistant bacteria. Currently, antimicrobial or disinfecting agents do not seem to be used in dishwasher detergents and rinse aids in Europe.

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

Organochlorine compounds and hypochlorite

Sodium hypochlorite and organic chlorine compounds are used as disinfecting/antibacterial substances and bleach. Organic chlorine compounds may be or lead to the formation of toxic and bioaccumulative substances that are hard to break down. Chlorine based bleach generally have unwanted health and environmental properties. Reactive chlorine compounds such as hypochlorite are toxic but degrade quickly. Sodium hypochlorite can constitute an environmental

[8] 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

[9] 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.

[10] 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

risk due to the risk of creating organic chlorine compounds. Use of chlorine based bleach is not common in dishwasher detergents in the Northern Europe but is used in other parts of the world. The exclusion is seen as a preventive measure.

Reactive chlorine compounds were prohibited also in generation 6.

Methylisothiazolinone

Allergies to preservatives, particularly MI (CAS 2682-20-4) have risen in recent years[11] and Nordic Ecolabelling does not want to contribute towards unnecessary exposure. A large proportion of our licensees and the Nordic retail chains wish to avoid MI (CAS 2682-20-4) as a preservative. Many of the Danish and Norwegian retail chains have banned MI in their Private Labels, and some also have bans/restrictions on MI in branded goods. Note that MI is prohibited by the requirement on Classification of ingoing substances. It is listed in the prohibited substances requirement for communicative purposes.

Microplastics

Microplastics[12] are very small fragments of plastic material, less than 5 mm. They can be harmful to health and the environment due to their size, surface properties, resistance to degradation and because they can carry harmful chemicals. In nature, microplastics come from pellets, paint, tires, textiles, personal care products and various plastic items. They have been found all over the world, at sea, in freshwater, sediments, sludge from wastewater treatment plants and agricultural soil. Microplastics have been detected in various aquatic organisms across the food chain, from zooplankton to vertebrates and in human tissues and organs such as blood and placenta. The Nordic Swan Ecolabel uses the precautionary principle and strives to limit the use and release of microplastics wherever possible.

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

According to DG Environment report[13] 190-200 tonnes/year of microplastics are thought to be used in soaps, detergents and maintenance products. Plastics used are for example polyester, polyurethane, and PMMA. Microplastics can according to the report be used as e.g. rheology modifiers and enzyme encapsulation (30-

[11] SCCS opinion on Methylisothiazolinone (2013) https://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_145.pdf (Accessed 2020-11-10).
[12] https://www.nordic-swan-ecolabel.org/nordic-ecolabelling/environmental-aspects/chemicals-nano-and-microplastics/microplastics/
[13] European Commission (DG Environment), Intentionally added microplastics in products Final report, http://ec.europa.eu/environment/chemicals/reach/pdf/39168%20Intentionally%20added%20microplastics%20-%20Final%20report%2020171020.pdf, October 2017

5000µm). Anti-redeposition agents are often polymers and can therefore be microplastics.

When microplastics are rinsed down the drain, they often end up in the sludge, but they also pass through the treatment plants[14]. They can have adverse effects on health and the environment due to their size, resistance to degradation and surface properties, either by physically affecting organisms or because they carry harmful chemicals. Microplastics can accumulate in living organisms, for example shellfish and fish, and be ingested by humans through food or water[15].

There is however a lack of knowledge of fate and effects of microplastics. Since they are non-degradable and potentially harmful precautionary principle is used and microplastics are excluded even though microplastics from dishwasher detergents are a small part of the microplastics problem. Dishwasher detergents are also covered by ECHAs proposal for restriction[16].

Note that foils/films wrapping tablets and other such products releasing microplastics are not allowed in Nordic Swan Ecolabelled products.

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

Nanomaterials

Due to their small size and large surface area nanoparticles are usually more reactive and may have other properties compared to larger particles of the same material. There is concern among public authorities, scientists, environmental organisations etc. about the lack of knowledge regarding the potential

[14] Miljøstyrelsen, Environmental Project No. 1906 Microplastic in Danish wastewater Sources, occurrences and fate, 2017, http://www2.mst.dk/Udgiv/publications/2017/03/978-87-93529-44-1.pdf
[15] 3 Annex XV restriction proposal for Intentionally added microplastics, Version number: 1, 11 January 2019, https://echa.europa.eu/documents/10162/82cc5875-93ae-d7a9-5747-44c698dc19b6
[16] Annex XV restriction proposal for Intentionally added microplastics, Version number: 1, 11 January 2019, https://echa.europa.eu/documents/10162/82cc5875-93ae-d7a9-5747-44c698dc19b6

detrimental effects on health and the environment[17],[18],[19],[20],[21],[22],[23],[24],[25] Surface coatings and other modifications can also alter their properties. Nordic Ecolabelling takes the concerns about nanomaterials seriously and applies the precautionary principle to exclude nanomaterials in the products. The European Commission recommendation for a definition of nanomaterials of 18 October 2011 (2011/696/EU)[26] is used.

Most nanomaterials on the market today have either used for decades, or are more recently enginereed nanoforms of existing materials[27]. Nanoparticles of carbon black and amorphous silica (SiO_2) have been used for the last century. Titanium dioxide, TiO_2, has long been used as a colourant in the bulk form, but is now manufactured as nanomaterial for other purposes[28]. Other types of engineered nanomaterials are expected to come onto the market in the future[29].

Substances judged to be "Substances of very high concern", which are included on the 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, which states: substances which are CMR (categories 1A and 1B in accordance with the CLP Regulation), PBT substances, vPvB substances (see the section below) and

[17] UNEP (2017) Frontiers 2017 Emerging Issues of Environmental Concern. United Nations Environment Programme, Nairobi. https://wedocs.unep.org/bitstream/handle/20.500.11822/22255/Frontiers_2017_EN.pdf?sequence=1&isAllowed=y
[18] Parliamentary Assembly of the Council of Europe (2017 (2013)) Nanotechnology: balancing benefits and risks to public health and the environment. http://semantic-pace.net/tools/pdf.aspx?doc=aHR0cDovL2Fzc2VtYmx5LmNvZS5pbnQvbncveG1sL1hSZWYvWDJILURXLWV4dHIuYXNwP2ZpbGVpZD0xOTczMCZsYW5nPUVO&xsl=aHR0cDovL3NlbWFudGljcGFjZS5uZXQvWHNsdC9QZGYvWFJlZi1XRC1BVC1YTUwyUERGLnhzbA==&xsltparams=ZmlsZWlkPTE5NzMw
[19] Larsen PB, Mørck TAa, Andersen DN, Hougard KS (2020) A critical review of studies on the reproductive and developmental toxicity of nanomaterials. European Chemicals Agency.
[20] SCCS (Scientific Committee on Consumer Safety) (2019) Guidance on the Safety Assessment of Nanomaterials in Cosmetics. SCCS/1611/19. https://ec.europa.eu/health/sites/health/files/scientific_committees/consumer_safety/docs/sccs_o_233.pdf
[21] Mackevica A, Foss Hansen S (2016) Release of nanomaterials from solid nanocomposites and consumer exposure assessment - a forward-looking review. Nanotoxicology 10(6):641–53. doi: 10.3109/17435390.2015.1132346
[22] BEUC – The European Consumer Organisation et. al (2014) European NGOs position paper on the Regulation of nanomaterials. www.beuc.eu/publications/beuc-x-2014-024_sma_nano_position_paper_caracal_final_clean.pdf
[23] SweNanoSafe. Nationell plattform för nanosäkerhet. https://swenanosafe.se/ (2020-05-06)
[24] BEUC – The European Consumer Organisation. Nanotechnology. www.beuc.eu/safety/nanotechnology (2020-05-06)
[25] Azolay D and Tuncak B (2014) Managing the unseen – opportunities and challenges with nanotechnology. Swedish Society for Nature Conservation. www.naturskyddsforeningen.se/sites/default/files/dokument-media/rapporter/Rapport-Nano.pdf
[26] https://eur-lex.europa.eu/legal-content/SV/TXT/PDF/?uri=CELEX:32011H0696&from=EN
[27] EU observatory for nanomaterials and European Chemicals Agency (2019) What are next generation nanomaterials and why are regulators interested in them? Information note. https://euon.echa.europa.eu/documents/23168237/24095696/190919_background_note_next_gen_materials_en.pdf/b9178324-5a69-2e4b-1f2b-aac2c2845f45
[28] European commission, COMMISSION STAFF WORKING PAPER, Types and uses of nanomaterials, including safety aspects, Accompanying the [..] second regulatory review of nanomaterials, SWD(2012) 288 final
[29] EU observatory for nanomaterials and European Chemicals Agency (2019) What are next generation nanomaterials and why are regulators interested in them? Information note. https://euon.echa.europa.eu/documents/23168237/24095696/190919_background_note_next_gen_materials_en.pdf/b9178324-5a69-2e4b-1f2b-aac2c2845f45

substances which are endocrine disruptors or environmentally hazardous without fulfilling the requirements for PBT or vPvB. SVHC can be included on the Candidate List for later admission to REACH Annex XIV or XVII. Based on these adverse characteristics, Nordic Ecolabelling prohibits substances on the Candidate List. There is some overlap between the SVHC substances and other substances listed in this requirement or other requirements. E.g. SVHC substances are also addressed via the requirements on classification of the product and ingoing substances; prohibition of PBT and vPvB substances; and prohibition of endocrine disruptors.

The requirement concerning SVHC substances is the same as in generation 6 of the criteria.

Endocrine disruptors

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

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

A substance listed on any of List I; II; and/or III is excluded. List I contains substances identified as EDs at EU 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 substances on List I-III are excluded from all raw materials and products as specified in the requirement, meaning that substances listed with reference to e.g. the cosmetics regulation are not only excluded from cosmetics.

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

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. Special attention is needed concerning those List II substances that are evaluated under the Cosmetics regulation. Since it's not within the scope of the regulation to identify EDs, it's not clear how the substances will be handled at www.edlists.org once the evaluation (safety assessment of the substances in cosmetics) is finalised. Nordic Ecolabelling will evaluate the circumstances on a case-by-case basis.

By excluding both identified and prioritised potential EDs which are under evaluation, the Nordic Swan Ecolabel ensures a restrictive policy on EDs.The requirement is updated compared to generation 6.

PBT and vPvB

PBT (persistent, bioaccumulative and toxic) and vPvB (very persistent and very bioaccumulative) are organic substances as defined in Annex XIII of REACH (Directive 1907/2006/EC).[30] Nordic Ecolabelling wants to avoid these substances.

Most PBT/vPvB are excluded automatically from dishwasher detergents and rinse aids due to the restrictions on environmentally hazardous substances. Since some of them, primarily vPvB, may possibly not be excluded in accordance with environmentally hazardous substances, they are explicitly prohibited by Nordic Ecolabelling.

Note that substances that have not yet been investigated but that meet the criteria for PBT and vPvB are also prohibited. The ban thus also applies to PBT and vPvB substances on the SIN list that are not yet on the SVHC list. This part of the requirement is new compared to generation 6.

O6 Phosphorous

The total amount of phosphorous must not exceed the following:

Dishwasher detergents ≤ 0.20 g P/wash.
Rinse aids ≤ 0.030 g P/wash

Note the national legislation concerning phosphorous in Sweden, regulation 2010:267.

✉ Documentation of the content of phosphorous in the product: Appendix 2 and 3 or equivalent certification completed and signed.

✉ Calculation showing that the requirement is fulfilled. Nordic Ecolabelling's calculation sheet can be used and can be obtained from https://www.nordic-swan-ecolabel.org/criteria/dishwasher-detergents-and-rinse-aids-017/ or Nordic Ecolabelling's national websites.

Background to requirement O6

Phosphorous is a source of eutrophication of water bodies. In 2010, the European Commission carried out an impact assessment regarding the use of phosphates

[30] 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

and other phosphorus compounds in household laundry detergents[31]. The four main sources of phosphates in the environment were identified as: fertilisers, metabolic waste from humans and livestock and detergents. Overall, phosphorous from STPP based detergents represented less than 10% of the phosphorous used in fertilisers. Nevertheless, the assessment concluded that restriction of phosphates in laundry detergents would be an effective and proportionate measure to reduce the eutrophication risk throughout the EU. The same assessment showed that the impact from dishwasher detergents was approximately the half of that from laundry detergents. A restriction was introduced both for consumer laundry detergents and consumer dishwasher detergents in the Detergent regulation from 30 June 2013[32].

The requirement is the same as in generation 6. However, note that in addition phosphates have now been added to the list of prohibited substances (requirement O5). This has been done to ascertain that there will not be any conflicts between phosphorous levels in Nordic Swan Ecolabelled products and the Swedish regulation 2010:267.

O7 Fragrances

a) Fragrances must be added in line with IFRA's guidelines. The guidelines of IFRA (International Fragrance Association) can be found at www.ifraorg.org/

b) A fragrance substance which is judged to be sensitising with the hazard statement H317 and/or H334, or which is subject to declaration according to EC No 648/2004 and subsequent amendments, may be present at a maximum of 0.0100% (100 ppm) in the detergent. If the packaging contains fragrance, the 100 ppm limit applies to the packaging fragrance as is.

c) The fragrance substances in Table O7 may be present in the detergent at a maximum of 0.0100% (100 ppm) per substance. If the packaging contains fragrance, the 100 ppm limit applies to the packaging fragrance as is.

d) HICC (CAS 31906-04-4), Chloroatranol (CAS 57074-21-2), Atranol (CAS 526-37-4), Lilial (CAS 80-54-6) and Benzyl salicylate (CAS 118-58-1) are not permitted in the detergent or packaging.

e) Fragrance is not permitted in rinse aid. This also applies to the packaging.

The requirement includes fragrance in plant extracts. The requirement also includes fragrance added to the packaging.

[31] SEC(2010) 1277 final. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010SC1277&from=EN (accessed 2020-10-12).
[32] Regulation (EU) No 259/2012 of the European Parliament and of the Council.

Table O7 Other fragrance substances that may be present to a maximum of 100 ppm

INCI name (or, of none exists, perfuming name according to CosIng)	CAS number
Cananga Odorata and Ylang-ylang oil	83863-30-3; 8006-81-3
Eugenia Caryophyllus Leaf / Flower oil	8000-34-8
Jasminum Grandiflorum / Officinale	84776-64-7; 90045-94-6; 8022-96-6
Myroxylon Pereirae	8007-00-9;
Santalum Album	84787-70-2; 8006-87-9
Turpentine oil	8006-64-2; 9005-90-7; 8052-14-0
Verbena absolute	8024-12-02
Cinnamomum cassia leaf oil/Cinnamomum zeylanicum, ext.	8007-80-5/84649-98-9

☒ Appendix 2 and 3 or equivalent certification completed and signed.

☒ Fragrance specifications.

☒ Calculation of the amount of the 26 allergens, substances classified as H334 and/or H317 and substances listed in table O7 present in the detergent and/or the packaging.

Background to requirement O7

Most fragrances contain sensitizing substances and some fragrances even have other unwanted effects on health and environment. A complete ban of fragrance ingredients is expected to markedly compromise the market penetration of ecolabelled dishwasher detergents and thus decrease the overall environmental benefit of the ecolabelled products. Therefore Nordic Ecolabelling do not ban fragrances, but set strict requirements to minimise the risk for allergy.

a) Conformity with the Code of Practice of the International Fragrance Association ensures that manufacture, handling and use of the fragrance fulfils certain standards regarding prohibited substances, restricted use and purity. The IFRA Code of Practice supports commitment to provide products that are safe for use by the consumer and to the environment. The Code of Practice applies to the manufacture and handling of all fragrance materials, for all types of applications and contains the full set of IFRA Standards (IFRA).

b) The restriction on sensitising fragrance substances is included to reduce the exposure of allergenes when using ecolabelled products.

c) The first seven substances in the table are the ones that are identified with the greatest risk of sensitisation in the SCCS report 1459/11[33]. The last one has been identified by the Danish EPA[34].

d) SCCS 1459/11 recommends that Hydroxyisohexyl 3-cyclohexene carboxaldehyde, Chloroatranol and Atranol are not included in cosmetic products. We therefore consider it relevant to prohibit them in dishwasher detergents as well. Lilial (CAS 80-54-6) that has been self-classified as Repr2 H361 is added the list to be clear that it is excluded even though it is also excluded by classification of ingoing substances. Benzyl salicylate (CAS 118-58-1) is suspected to be a potential endocrine disruptor[35] and therefore excluded in this criteria generation.

e) The market share of fragrance-free products is bigger for rinse aids than for dishwasher detergents. Hence, we find it viable to prohibit fragrance in this product segment without compromising the market penetration.

In the previous generation, the fragrance requirement applied only to the product's formulation. In this generation, packaging has been included as well, in order to ensure consumer protection to allergen exposure regardless of in which part of the product the fragrance is present. Part c has been updated and parts d and e are new requirements in this criteria generation.

O8 Enzymes

Enzymes must be in liquid form or granulate capsules.

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

Background to requirement O8

Enzyme dust is classified as respiratory sensitizing with H334. Therefore, Nordic Ecolabelling requires that enzymes must be in liquid form or in the form of granules. This reduces the risk of exposure to enzymes in the manufacture of detergent products. For further risk measurements during production, see e.g. AISE's recommendations for safe handling of enzymes[36]. The requirement is the same as in generation 6.

O9 Colourants

Colourants, in the final product or in constituent substances regardless of function, must not be bioaccumulative or must be approved for use in food with an E-number.

33 http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_073.pdf (accessed 2019-01-14)
34 Miljøstyrelsen 2016, Environmental project No. 1840, Evaluation of selected sensitizing fragrance substances A LOUS follow-up project http://www2.mst.dk/Udgiv/publications/2016/03/978-87-93435-46-9.pdf (accessed 2019-01-14).
35 Call for data on ingredients with potential endocrine-disrupting properties used in cosmetic products, Published on 16/05/2019, https://ec.europa.eu/growth/content/call-data-ingredients-potential-endocrine-disrupting-properties-used-cosmetic-products_en (accessed 2019-07-04)
36 https://www.aise.eu/our-activities/standards-and-industry-guidelines/safe-handling-of-enzymes.aspx (accessed 2019-01-14).

Colourants are judged not to be bioaccumulative if BCF < 500 or logKow < 4. If both values are available, the value for the highest measured BCF is to be used, see appendix 1.

✉ Appendix 2 and 3 or equivalent certification completed and signed.

✉ Statement of the E-number (number allocated as part of approval for use in food), or documentation of logKow value (octanol/water partition coefficient) or BCF value (bioconcentration factor).

Background to requirement O9

Colourants are primarily added to the products for aesthetic reasons. Nordic Ecolabelling prohibits bioaccumulative colourants, as bioaccumulative substances collect in the fat tissue of living organisms and can cause long-lasting damage to the environment.

The requirement is the same as in generation 6.

2.4 Dosing, ecotoxicity and biodegradability

For dishwasher detergents: The requirements in this chapter are based on the highest recommended dosage stated on the packaging, regardless of water hardness and degree of soiling.

If the product is dosed as a unit containing a water-soluble foil intended not to be removed before washing, the foil must be included as part of the product formulation in the calculations.

For rinse aid: The requirements in this chapter are based on a dosage of 3 ml per dish.

O10 Maximum dosage

The maximum dose per wash must not exceed the limit values in the table below, regardless of water hardness and degree of soiling.

Table: Limit values for dosing

Dishwasher detergents	dose g/wash
Single function products	18.0
Multifunctional products	20.0

Rinse aid is exempted from this requirement.

✉ Product label including dosage recommendations.

Background to requirement O10

Nordic Ecolabelling believes that it is relevant to maintain a maximum dosage requirement, to limit the use of fillers and water (for liquid products). It contributes to less packaging and transports needed. The maximum dosage refers to the highest recommended dosage, as stated on the product label, for a fully loaded 12 place settings dishwashing machine.

It has been clarified that "maximum dosage" relates to the highest recommended dosage that is stated on the packaging, regardless of water hardness and degree of soiling. The requirement is the same as in generation 6.

O11 Long-term environmental effects

The use of ingoing substances that are classified with any of the hazard statements H410, H411 or H412 is limited as follows.

Dishwasher detergents:

$100*C_{H410} + 10*C_{H411} + C_{H412} \leq 0.060$ grams/ wash

Rinse aids:

$100*C_{H410} + 10*C_{H411} + C_{H412} \leq 0.0050$ grams/ wash

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

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

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

Exemptions (Note that all products need to fulfil the requirement O2 "classification of the product"):

- Surfactants classified with H411 and H412 are exempted from the requirement, provided that they are readily degradable* and anaerobically degradable**.
- Subtilisin classified with Aquatic Chronic 2 (H411) is exempted from the requirement.
- Hydrogen peroxide classified with Aquatic Chronic 3 (H412) is exempted from the requirement.

* *In accordance with the DID-list version 2016 or later or 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.*

** *In accordance with the DID-list version 2016 or later or ISO 11734, ECETOC No 28 (June 1988), OECD 311 or other equivalent test methods evaluated by an independent body and controlled by Nordic Ecolabelling.*

If information about the substance being hazardous to the environment (in the form of data concerning toxicity and biodegradability, or toxicity and bioaccumulation) is not available, the substance is treated as a "worst case", i.e. as environmentally hazardous, H410. If data on biodegradability or bioaccumulation is required to decide on the classification, and such data is missing, the substance is treated as a "worst case", H410.

✉ Calculation according to the formula above showing that the requirement is fulfilled. Nordic Ecolabelling's calculation sheet can be used and can be obtained from https://www.nordic-swan-ecolabel.org/criteria/dishwasher-detergents-and-rinse-aids-017/ or Nordic Ecolabelling's national websites.

✉ Appendix 2 and 3 or equivalent certification completed and signed.

✉ An overview on surfactants that are to be exempted from the requirement (quantity, classification, biodegradability). See Appendix 1 for test requirements.

Background to requirement O11

A Nordic Swan Ecolabelled dishwasher detergent or rinse aid must not be classified as environmentally hazardous, see requirement Classification of the product. To further reduce potential impacts on the aquatic environment, a limit to the maximum content of environmentally hazardous substances in a product has been set.

For the sake of simplicity, Nordic Ecolabelling has decided not to include M-factors (as defined in the CLP regulation 1272/2008 with subsequent amendments) in the requirement.

The limit values have been tightened compared to generation 6, based on licence data.

Exemptions

Nordic Ecolabelling continues to exempt aerobically and anaerobically biodegradable surfactants with the H412 classification from the requirement. It has been decided to grant the same exemption to H411-classified surfactants as to H412-classified ones. Introducing this additional exemption will not give rise to the certification of more toxic formulations than the ones already approved today. The requirement "Classification of the chemical product" will restrict the amount of H411 and H412 classified surfactants to 2,5% and 25%, respectively. In addition, the "Critical dilution volume"-requirement will restrict the content of highly aquatic toxic surfactants.

Protease (Subtilisin, EINECS 232-752-2, CAS 9014-01-1) degrades efficiently protein-based stains and cannot be replaced by other enzymes. Protease is classified as Aquatic Chronic 2 (H411), even though it is readily biodegradable. Protease is exempted from the requirement in order to achieve well performing dishwasher detergents.

Hydrogen peroxide (CAS 7722-84-1) is released from sodium percarbonate, and degrades efficiently bleachable stains. It is essential in many powder compositions. Hydrogen peroxide is classified as Aquatic Chronic 3 (H412), even though it degrades quickly in the environment. Hydrogen peroxide is exempted from the requirement in order to achieve well performing dishwasher detergents.

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

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

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

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

O12 Critical dilution volume (CDV)

The product's critical dilution volume (CDV) shall not exceed the limit values for $CDV_{chronic}$ in table O12.

Table O12. CDV limits

	CDVchronic [litres/wash]
Dishwasher detergents (multifunction)	25 500
Dishwasher detergents (single function)	22 500
Rinse aids	5 000

CDVchronic = ∑ CDVi = ∑ (dose(i) x DFi x 1000 / TFchronic)

where

dose(i) = dose of component i, expressed in g/wash

DFi = degradation factor for substance i

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.

✉ Calculations of CDVchronic for the dishwasher detergent and/or rinse aid. Nordic Ecolabelling's calculation sheet can be used and can be obtained from https://www.nordic-swan-ecolabel.org/criteria/dishwasher-detergents-and-rinse-aids-017/ or Nordic Ecolabelling's national websites.

Documentation of each substance shall refer to the DID list version 2016 or later. If substances are not on the DID list, or data on the DID list is lacking, the parameters must be calculated based on the guidance in part B of the DID list, and the related documentation must be submitted.

Background to requirement O12

The critical dilution volume (CDV) is a theoretical value that takes account of each substance's toxicity and biodegradability in the environment. The concept was originally developed together with the EU Ecolabel. A maximum limit for CDV ensures that the Nordic Swan Ecolabelled products have a limited impact on the recipient watercourse.

In this generation CDV is calculated only with chronic values. The use of chronic data is generally preferable, since long-term toxicity data is considered of higher quality and gives more precise/reliable estimates of potential environmental effects compared with acute toxicity data. The requirement specifies that if TFchronic is lacking, TFacute may be used. The applied safety factors are larger for acute toxicity values than for chronic values.

The CDV limit values have been tightened for all three categories, based on licence data.

O13 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.

- Surfactants classified as hazardous to the aquatic environment, chronic*, 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.

**Classified with H410, H411, H412, H413.*

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

If the DID list lacks the relevant data for surfactants, data may be taken from the safety data sheet on the condition that the data is reliable and that the test methods are in agreement with Appendix 1. Section B of the DID list shows how to make the calculations of the various factors. It is also permitted to refer to read across conducted by an independent third party. Nordic Ecolabelling will evaluate the quality of read across and decide whether it can be accepted.

Background to requirement O13

This requirement relates to substances that are regarded as surfactants according to Detergent Regulation ((EC) No 648/2004 with subsequent amendments).

Compounds that accumulate in the environment can pose a risk both now and in the future. Biodegradability under aerobic and anaerobic conditions is therefore of major environmental importance. Surfactants are considered to be key in this context, since they are discharged in large quantities.

Aerobic biodegradability is required by the Detergent regulation ((EC) 648/2004 with subsequent amendments). For the sake of clarity, Nordic Ecolabelling still maintains this as a specific requirement.

During the pre-consultation period we investigated whether to extend the requirement of anaerobic biodegradability to all surfactants regardless of classification (in line with i.a. generation 8 of our laundry detergent criteria). Several stakeholders commented that this would limit the choice of surfactants that are particularly effective within this product group. It could potentially lead to a burden shift requiring e.g. more chemicals to maintain the product performance. Hence, we have decided to uphold the requirement as in generation 6 of the criteria.

O14 Water-soluble film

- All water-soluble films (e.g., PVA films) for dishwasher detergents must be readily biodegradable according to test method No. 301 A–F or No 310 in OECD guidelines for testing of chemicals. Enhanced biodegradation[37] screening test performed as a modification of OECD 301B or OECD 301F with longer incubation and continued biodegradation measurements up to 60 days is accepted.
- The test should be conducted on the total composition of the film. This can either be by testing on the actual water-soluble film or individually on each of the substances in the film.
- Existing data for the biodegradability of individual substances and existing data for actual water-soluble films can be used to predict the biodegradation

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

properties of another water-soluble film. This is accepted only if either of the following data is available:

a) Case 1 – Substance-based approach:
When all the substances in the water-soluble film have been tested individually in a biodegradation test, and all the substances comply with the requirements to biodegradability in the criteria, then the water-soluble film can be considered to fulfil requirement O14. Data must be provided for all ingoing substances in the water-soluble film, that are present above 0.1 % in the water-soluble film.

OR

b) Case 2 – Water-soluble film-based approach:
If two water-soluble films (film 1 and film 2) with a known composition of substances have been confirmed biodegradable according to the above mentioned test guidelines, the same biodegradability can be assumed for a third product (film 3), if both of the following two conditions are met:

- The concentrations of the substances in film 3 are within the concentration range covered by film 1 and film 2

- Any other substances in film 3, that are not present in film 1 and film 2, have been confirmed biodegradable according to the above mentioned test guidelines.

✉ Test report(s) documenting the biodegradability of the film, conducted by a certified test laboratory according to Appendix 1.

Background to requirement O14

This is a new requirement.

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

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

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

A review from 2011 based on 68 scientific studies on identification and quantification of microplastics from the marine environment, found PVA in three

studies[38]. A large-scale survey of microplastics in Mediterranean waters in 2016, identified sixteen different classes of synthetic materials. Here, PVA accounted for 1,2 % of the microplastics.

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

O15 Anaerobic biodegradability

The content of organic non-anaerobically degradable substances (anNBO) in the dishwasher detergent (multifunction and single function products) and rinse aid must not exceed:

Dishwasher detergent ≤ 1.2 g/wash

Rinse aid ≤ 0.30 g/wash

Note the certain substances, that are not surfactants, can be exempted from this requirement. See the conditions in "Appendix 1, item 6, Anaerobic biodegradability".

✉ Calculation of the concentration of anNBO for the product. Nordic Ecolabelling's calculation sheet can be used and can be obtained from https://www.nordic-swan-ecolabel.org/criteria/dishwasher-detergents-and-rinse-aids-017/ or Nordic Ecolabelling's national websites.

✉ Reference to the DID list, 2016 or later versions. If substances are not on the DID list, or data on the DID list is lacking, the related documentation must be submitted (cf. DID list 2016 part B).

Background to requirement O15

A general requirement on the permitted amount of non-anaerobically degradable substances reduces the use of non-biodegradable substances to a minimal level. The requirement concerning the degradability of organic substances generally gives ecolabelled products a good degradability profile.

Examples of substances commonly used in dishwasher detergents that are not anaerobically degradable (anNBO) include: certain surfactants (e.g. sulphonated anionic surfactants), phosphonates, fragrances and colourants.

A combination of requirements concerning the amount of non-anaerobically degradable substances and CDV ensures that the total quantity of non-degradable substances and/or toxic substances is limited, but still provides a certain amount of flexibility in the formulation of the products.

The requirement is the same as in generation 6.

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

2.5 Performance

O16 Performance of the dishwasher detergent

The dishwasher detergent must perform as well or better than the reference detergent IEC-D*, when tested and evaluated in accordance with point a) below.

If 7 soils are tested: The dishwasher detergent must perform as good as or better than the reference detergent IEC-D in all soil classes, meaning that the results for the average (arithmetic mean) of soil types within each soil class must be at least as good as or better than the reference detergent. Alternatively, the overall mean for all soil types must be 20% higher than that of the reference.

If only 4 soils are tested: The dishwasher detergent must perform as good as or better than the reference detergent for all 4 soils. Alternatively, the overall mean for all soil types must be 20% higher than that of the reference.

A minimum of 3 wash cycles must be run. Statistical treatment with 95% confidence must be performed (example: Analysis of Variance (ANOVA) according to the HSD Tukey's test).

a) The cleaning performance of the dishwasher detergent must be tested according to the IKW test method "Recommendations for the Quality Assessment of the Cleaning Performance of Dishwasher Detergents (Part B, Update 2015)", with the following specifications/modifications:

- Test temperature of test product and reference 45ºC, holding time after reaching the main wash temperature: 8 minutes.
- Reference detergent IEC-D must be used with a dose of 20 g. Test detergent must be dosed according to the recommended dosage at 6º dH. Rinse aid formula III (IEC 60436), 3 ml, may be used with classic products and with the reference.
- Water hardness: 6ºdH.
  The test product can be run at water hardness higher than 6º dH. The dosage of the test product must, nevertheless, be as recommended at 6º dH (cf. above). The reference detergent IEC-D must be run at 6ºdH (cf. above).

b) Other claims concerning the performance of the product (e.g., short cycles, lower temperatures, specific stains etc.) must also be tested (with relevant test methods) and documented. Rinse aid function of multifunctional products must be proved according to the separate requirement O17 "performance of the rinse aid".

The tests in a) and b) must be performed by a laboratory that meets the requirements concerning test laboratories in Appendix 1.

* *Nordic Ecolabelling may extend the requirement with an additional reference detergent during the validity period of the criteria.*

✉ Complete test report including test temperature, water hardness, dosage, description of how the test was carried out, test results and conclusion.

✉ Tests documenting any other claims made on the packaging.

✉ Documentation on the test laboratory, in accordance with Appendix 1.

Background to requirement O16

Documentation of performance is crucial for the credibility of the Nordic Swan Ecolabel. Nordic Ecolabelling's ambition on performance is to ensure that the product is fit for use and fulfils the consumers' expectations of a satisfactorily functioning product. Our performance test is based on the IKW test method[39] "Recommendations for the Quality Assessment of the Cleaning Performance of Dishwasher Detergents (Part B, Update 2015)", which is widely used as industry standard.

Nordic Swan Ecolabel specific modifications:

- The test temperature and holding time have been specified, since they appear only as suggestions in the IKW protocol. Energy in the usage phase stands out as the largest parameter in the dishwasher detergent's life cycle (cf. MECO analysis in the chapter on "Environmental impact of dishwasher detergents and rinse aids"). Hence, product efficiency at low temperature (45°C), enabling consumers to use low temperature, can lead to substantial environmental benefits in terms of energy savings.

- The modification with respect to IKW water hardness (prescribed from 8-10°dH and upwards) is due to the generally lower water hardness found in the Nordic region, as well as to the recommendation of using salt in hard water areas, to obtain soft water washing conditions. This is equal to the Nordic Swan Ecolabel modification in generation 6. Higher water hardness is allowed. The specified conditions for higher water hardness are formulated to ensure that the test also supports the product's efficiency at 6°dH.

- The reference detergent IEC-D has been chosen in line with the previous criteria generation. IEC-D is widely supported as a reference by the stakeholders. IEC-B contains perborate (CMR substance) and is no longer allowed in the Nordic Swan Ecolabel protocol.

- The pass criteria are clearly specified. The pass level is slightly adjusted compared to criteria generation 6. The IKW protocol does not contain pass/fail criteria.

Other changes with respect to generation 6: Rinse aid is no longer required in the dishwasher detergent test protocol. A separate requirement for performance of rinse aid has been introduced, and it has been specified that rinse aid function of multifunctional products must be substantiated according to that requirement.

O17 Performance of the rinse aid

The rinse aid must perform as good as or better than rinse aid formula III (IEC 60436). This means that parity or better is achieved on at least 6 of the 8 criteria (spotting and filming across at least four different kind of objects that are tested). Statistical treatment with 95% confidence must be performed (example: Analysis of Variance (ANOVA) according to the HSD Tukey's test).

39 https://www.ikw.org/fileadmin/ikw/downloads/Haushaltspflege/2016_EQ_Dishwasher_Detergents_Part_B__Update_2015.pdf Accessed 2020-10-28

The test design must be in line with the following framework:

- Water hardness: At least 9°dH for classic products (with or without rinse aid function). At least 18°dH for multifunctional products (with rinse aid and salt function). The water hardness shall be the same for the test and reference product.
- Wash temperature 50ºC, rinsing temperature 65ºC.
- Dosage
    - Reference: Rinse aid formula III: 3 ml. In addition, 20 grams of IEC-D reference detergent must be used.
    - If test product is a rinse aid liquid: 3 ml test product. In addition, 20 grams of IEC-D reference detergent must be used.
    - If test product is a classic product (with rinse aid function): One standard dose as recommended at 6ºdH.
    - If test product is a multifunctional product with rinse aid function: One standard dose as recommended at 18ºdH.
- 50 grams of ballast soil must be used in each wash cycle. The ballast soil must be based on starch, protein and fat. Additionally, other constituents from food ingredients may also be present.
- The commercial ion exchanger must be disabled.
- At least 3 wash cycles must be carried out, cumulative, before assessment.
- The products must be assessed on spotting and filming across at least 4 different kinds of objects including objects made of plastic, glass, ceramic/porcelain and stainless steel.

The tests must be performed by a laboratory that meets the requirements concerning test laboratories in Appendix 1B.

✉ Complete test report including test temperature, water hardness, dosage, description of how the test was carried out, test results and conclusion.

✉ Documentation on the test laboratory, in accordance with Appendix 1B.

Background to requirement O17

Documentation of performance is crucial for the credibility of the Nordic Swan Ecolabel. Nordic Ecolabelling's ambition on performance is to ensure that the product is fit for use and fulfils the consumers' expectations of a satisfactorily functioning product. There is no common industry standard for rinse aid performance testing. Nordic Ecolabelling has outlined a framework, based on input from several test institutes that already have well established internal test protocols. Spotting and filming are important indicators of the rinse aid performance themselves. Additionally, they give indirect information about the drying effect of these products. Tougher washing conditions in terms of harder water than what is normal in the Nordic region is necessary in the testing, in order to get an appropriate indication of the products' performance in course of only a few dishwasher cycles. Likewise, a higher temperature is necessary to get visible dry spots and an appropriate indication of the products' performance in course of only a few dishwasher cycles.

This is a new requirement.

2.6 Packaging

Packaging, plastic, and recycling of plastic is a focus area in society today. Nordic Ecolabelling wants to set strict requirements on packaging to reduce the material consumption and transport of packaging and air, and to ensure good possibilities for recycling, in order to support material recovery and circular economy.

The packaging requirements target the primary packaging* (e.g. container, closure, label). In addition, any part that is not consumed and rinsed down the drain during the washing process, such as a container for autodose/multidose products, must meet the packaging requirements. Only the packaging types described in criterion O19-O23 can currently be used. If you are interested in another packaging type (or e.g. another label type), please contact Nordic Ecolabelling to find out whether the criteria can be extended to include your format.

If the product is dosed as a unit containing a water-soluble foil intended not to be removed before washing, the foil must be included as part of the product formulation and not as packaging.

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

O18 Recycling of all packaging

It must be possible to recycle the main materials in the primary packaging in today's existing material recirculation systems in the Nordic countries. Incineration with energy recovery is not considered to be material recovery. The main materials are defined as the plastic or paper/paperboard making up 90% or more of the individual components (ref. requirement O19, O20, O22), and 60% or more in the case of paper-based packaging for liquid products (ref. requirement O23).

In case of doubt about the actual recyclability in the current Nordic systems, Nordic Ecolabelling may request the applicant to obtain additional substantiation about the recyclability from one of the Nordic Producer Responsibility organisations.

Note: Separate recycling of the label is not required.

✉ Documentation showing that the primary packaging is recyclable: List the used materials in Appendix 4 or 5 and define how the component should be recycled.

✉ Statement from one of the Nordic Producer Responsibility organisations, if specifically requested by Nordic Ecolabelling.

Background to requirement O18

The EU has adopted a circular economy action plan[40] that has a clear focus on recovery and recycling, particularly with regards to packaging material. Recyclability is important step in shifting towards circular economy.

[40] 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

O19 Rigid plastic packaging: Recycled material and Design for recycling

1. Recycled material

- All hard/rigid plastic packaging must contain a minimum 50% (by weight, calculated on the total mass of the container, closure and label) post-consumer/commercial recycled material (PCR)*.

2. Design for recycling

The primary packaging must have a design that enables material recovery. This means that:

- 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).

Exemptions:

Coloured packaging components made from PP are allowed to have up to 5% PE if it comes from the masterbatch.

PE- or PP-closures that are used in squeeze bottles: The closures can contain a TPE (thermoplastic elastomer)-membrane of the type TPE-PE (based on polyethylene), TPE-PP (based on polypropylene) or SEBS (Styrene-Ethylene-Butylene-Styrene thermoplastic elastomer). If the closure is to be used on a PET-bottle, the membrane must have a density below 1.0 g/ml.

- It is not allowed to add pigments to PET. Coloured, recycled PET-granulate where the pigment originates from the recycled material is allowed.
- Carbon black pigments must not be added to container or closure.
- Fillers (such as $CaCO_3$) must not be included in PE or PP containers or closures at a level that the density of the plastic exceeds 0.995 g / cm^3.
- Barriers are not allowed in plastic packaging.
- Metal must not be part of the container or closure.
- Silicone is not allowed in closures.

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

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

Note: We recommend our applicants not to use PCR qualities that are intended for food.

Container means e.g. bottle, box, can etc.

Closure means e.g. cap, lid, pump, spout, dosing device, oblate, seal.

Label means "traditional label", shrink film label/sleeve, direct print etc. (see O21 for details on label requirements).

☒ 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 4 Declaration from the manufacturer(s) of the packaging can be used as part of the documentation. Nordic Ecolabelling's calculation sheet can be used to summarize the used materials.

Background to requirement O19

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

The EU has adopted a circular economy action plan[41] that has a clear focus on recovery and recycling, particularly with regards to packaging material. EU has also accepted a plastic strategy[42] focusing on making recycling of plastics more profitable, reduce the use of single use plastic products, stop the littering of oceans, push investments and innovations regarding minimization of waste and work toward global solutions and standards to reduce the amounts of plastic used.

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

1. Recycled material

To promote the use of recycled materials and to save virgin resources, an obligatory requirement on the amount of post-consumer recycled materials (PCR) is introduced. The requirement level of 50% is expected to be ambitious but achievable at the time when the criteria are entering into force, based on experience from the Nordic Swan Ecolabel criteria for laundry detergents and stain removers (generation 8).

Note: We recommend our applicants not to use PCR qualities that are intended for food.

2. Design for recycling

The Nordic recycling manuals for plastic packaging[43] are the base for the requirement stating that plastic bottles/containers and closures must be made

[41] 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

[42] 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)

[43] "Plastförpackningar – En återvinningsmanual från FTI, version 0.7,
Suomen Uusiomuovi Oy: Opas kierrätyskelpoisen muovipakkauksen suunnitteluun
http://www.uusiomuovi.fi/document.php/1/130/packdes_painos_1/442070829017fd4aa7d7e00bf960978b (visited 2019-04-30)
https://plast.dk/wp-content/uploads/2018/11/Design-manual-ENG-Forum-for-Circular-Plastic-Packaging-NOVEMBER-2018.pdf, https://plast.dk/wp-content/uploads/2018/06/Bilag-A-designmanual.pdf;

from PE, PP or PET. These are the best plastics from a recycling perspective. Biodegradable plastics are not suitable in today's recycling systems and can cause problems in the material recovery process. TPE based on TPE-PE, TPE-PP and SEBS is allowed as membranes in squeeze-bottle closures made of PE or PP. These are compatible with PE/PP, hence small amounts will not disturb the recycling process or quality. Membranes on closures attached to PET-bottles must have a density < 1.0 g/cm2, in order to separate from the PET during the sink/float process[44].

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

For PE and PP carbon black is excluded from packaging and closures, to contribute to visually lighter recycled fraction, and to avoid issues with NIR-detection. For virgin PET, pigments are not accepted since there is no market for coloured PET packagings and coloured packagings are currently burned in Nordic recycling systems.

Fillers are restricted so that the HDPE or PP density does not exceed 0.995 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[45, 46].

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

This is a new requirement.

O20 Flexible plastic pouches: Design for recycling

The primary packaging must have a design that facilitates material recovery. This means that:

- 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).
- 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.
- Carbon black pigments must not be added to container or closure.

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);

[44] Correspondence with Sina Lystvet, Grønt Punkt Norge, 2021-01-08
[45] Plastkretsen and FTI, Bättre förutsättningar för återvinning av plastförpackningar.
[46] http://www.plasticsrecycling.org/hdpe (Accessed 2017-08-08)

- 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 0.995 g / cm^3.
- Metal must not be part of the container or closure with exemption for aluminium-layers and printing inks if the packaging is proven to be recyclable according to:
    - the guidelines developed by RecyClass. The packaging must get a minimum score of B (as stated on a recyclability rate certificate provided by RecyClass),

      or
    - must pass a sorting test made at a sorting facility demonstrating that the packaging is recyclable. Swedish FTI's or any other equivalent test method relevant for other Nordic countries can be used.
- Silicone is not allowed in closures.

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

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

✉ 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 4 Declaration from the manufacturer(s) of the packaging can be used. Nordic Ecolabelling's calculation sheet can be used to summarize the used materials.

✉ In case of metal content in the packaging because of the use of aluminium-layer or printing inks either; a recyclability rate certificate showing a minimum score of B and a letter of approval from RecyClass must be provided or; a test report and the corresponding protocol for the method used demonstrating the packaging passed the sorting test and is recyclable.

Background to requirement O20

The requirement is similar to the requirement to design for recycling of packaging for rigid plastic. Please refer to the background for that requirement. There is no PCR requirement for flexible plastic pouches. Until now there has been focus on transition from laminates to monomaterial in pouches, and monomaterial pouches with PCR is not yet readily available. Regarding the monomaterial requirement, Nordic Ecolabelling has decided to accept EVOH to a maximum of 5% (in relation to the total packaging weight) as a barrier coating. This is in line with what the recycling companies recommend so that the recycling process is not adversely affected.

RecyClass is a comprehensive cross-industry initiative that advances plastic packaging recyclability and ensures traceability and transparency of recycled plastic content in Europe. The trade association Plastics Recyclers Europe is behind the initiative[47].

The sortability of metal-containing flexible pouches depends on the quantity of metal they contain. High quantity of metals inside or on the surface of the packaging may affect sorting of the plastic material. Indeed, metal can reflect

[47] About RecyClass - RecyClass

NIR-light and consequently disturb the sensor. The plastic type cannot be identified, and the packaging sent to incineration.

If the packaging follows the recycling compatibility guidelines developed by FTI or RecyClass and gets a high score according to their ranking methodology, the metal contained will only have a pigmentation effect on the recyclate. Packaging containing an aluminium-layer of 5 um and thicker will get a bad score because they hamper proper recycling of the plastic fraction. Too much aluminium can make the fraction burn at the extruder when forming new plastic parts.

A recyclability rate certificate showing a minimum score of B and a letter of approval from RecyClass; alternatively, a test report and the corresponding protocol for the method used that demonstrate the packaging passed a sorting test and is recyclable, ensure that metals contained in the aluminium-layer or printing inks do not undermine recycling and sorting of the plastic material.

This is a new requirement.

O21 Labels for rigid plastic packaging: Design for recycling of packaging

- 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' Recyclability Evaluation Protocol for labels and adhesives on HDPE containers, version 1.0[48].

  - 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[49].

- Containers in polyethylene terephthalate (PET) must have a label of a different plastic material, with a density < 1.0 g/cm^3, or a paper label without fibre loss.

  - Paper labels without fibre loss: The suitability must be substantiated in accordance with Recyclass' Washing quick test procedure: For paper labels applied on HDPE & PP containers, standard laboratory practice, version 1.0[49].

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.
- 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

[48] https://recyclass.eu/wp-content/uploads/2024/07/REP-HDPE-02.pdf (Accessed on 2024-12-19).
[49] https://recyclass.eu/wp-content/uploads/2021/05/RecyClass-Washing-QT-Procedure-for-Paper-Labels-applied-on-HDPE-and-PP-Containers_FINAL.pdf (Accessed on 2021-06-11).

not be included in the calculation. If the label on the front of pack and back of pack are of different size, the maximum percentage of 60% shall be fulfilled for each side separately. For a cylindrical bottle, the calculation can also be based on the three-dimensional profile exclusive bottom and top of the bottle.

- Direct print on the container is not permitted except for date codes, batch codes and UFI (Unique Formula Identifier).

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

Please note: During 2024, RecyClass replaced the Washing quick test procedure for film labels applied on HDPE & PP containers with Recyclability Evaluation Protocol for labels and adhesives on HDPE containers. A corresponding evaluation protocol for PP is expected to be published in 2025, whereby the criteria will be updated with a reference to this protocol.

In the next revision of the label requirement, it is expected that PE and PP packaging must have a label made of the same material, and that paper labels will no longer be permitted.

✉ Label specifications showing the material used and density. Appendix 4 Declaration from the manufacturer(s) of the packaging 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 1, showing that the label is approved.

✉ If paper labels are used: Test report from a laboratory fulfilling the conditions in Appendix 1, showing that the label is approved.

✉ Declarations that PVC and other halogenated plastics, aluminium and other metals have not been used. Appendix 4 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 O21

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. Removable labels are preferred, in order to avoid decreasing the final quality of the recyclate further, by introducing different polymers in addition to adhesive and inks. Therefore passing Recyclass' Recyclability Evaluation Protocol for labels and adhesives on HDPE containers is required. During 2024, RecyClass replaced the Washing

quick test procedure for film labels applied on HDPE & PP containers with Recyclability Evaluation Protocol for labels and adhesives on HDPE containers. A corresponding evaluation protocol for PP is expected to be published in 2025, whereby the criteria will be updated with a reference to this protocol.

In the next revision of the label requirement, it is expected that PE and PP packaging must have a label made of the same material, and that paper labels will no longer be permitted.

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

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

This is a new requirement.

O22 Paper-based packaging for solid products: Recycled material and Design for recycling

1. Cardboard packaging

- Cardboard packaging for solid products must contain at least 90% paper/paperboard.
- A minimum of 90% by weight of the wood raw material that is used in the paper/cardboard must be made of 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.
- PVC or plastic based on other types of halogenated plastics must not be used in the packaging (container and closure).
- Aluminium and other metals must not be used in the packaging (container and closure).
- Paper labels are permitted. Other types of labels are not permitted. The label glue must be water soluble.
- Solid coloured cardboard is not permitted, except from white solid coloured cardboard, which is permitted

2. Corrugated board packaging

- Corrugated board packaging for solid products must contain at least 90% paper/paperboard.
- A minimum of 70% by weight of the wood raw material that is used in the paper/cardboard must be made of 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.
- PVC or plastic based on other types of halogenated plastics must not be used in the packaging (container and closure).
- Aluminium and other metals must not be used in the packaging (container or closure).
- Paper labels are permitted. Other types of labels are not permitted. The label adhesive must be water soluble
- Solid coloured corrugated board is not permitted, except from white solid coloured board, which is permitted.

** 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:

- 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 4 can be used.

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

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

✉ Declarations that aluminium and other metals has not been used. Appendix 4 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 O22

Legislation and infrastructure are in place for paper-/cardboard collection and recycling in the Nordic countries[51]. To promote the use of recycled materials and to save virgin resources, an obligatory requirement on the amount of recycled materials is introduced. The 90% and 70% recycled material requirement levels respectively, are based on current licence data for dishwasher detergents and laundry detergents as well as on further correspondence with stakeholders.

Two-sided plastic laminate is not allowed since the doble layer impedes the pulpability and leads to a low degree of fibre recovery. Specialized pulpers are required to obtain good fibre recovery for two-sided laminates. A significant proportion of the Nordic board waste is currently not sent to such specialised facilities[52].

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 labelsis 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[53].

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

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

This is a new requirement.

O23 Cardboard packaging for liquid products: Sustainable material and Design for recycling

- Cardboard packaging for liquid products must contain at least 60% paper/paperboard.
- At least 90% by weight of the primary packaging must be made of bio-based material** or post-consumer/commercial recycled material (PCR)* or a combination of these. A mass balance approach is permitted.
- Paper/paperboard:
    - A minimum of 70% of the wood raw material that is used in the paper/cardboard must originate from forestry certified under the FSC or PEFC schemes, or the raw material can be recycled (PCR)*, or a combination of the two.
    - The remaining proportion of wood raw material must be covered by the FSC/PEFC control schemes (FSC controlled wood/PEFC controlled sources).
- For bio-based** plastic:
    - Palm oil and soy cannot be used as a raw material.
    - Sugar cane raw material must be certified according to a standard that meets Nordic Ecolabelling's requirements for raw material standards. This requirement does not apply for secondary raw materials***.
- PVC or plastic based on other types of halogenated plastics must not be used.
- Aluminium and other metals must not be used.
- Labels are not permitted.
- Direct printing on the cardboard in the packaging must only be done with water-based inks.

Beverage carton packaging that is Nordic Swan Ecolabelled according to the criteria for Nordic Ecolabelling for Packaging for Liquid Foods can be used without further documentation of requirement O23.

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

*** Bio-based means that the material consists of biomass that may have undergone physical, chemical, or biological treatment(s). Biomass has a biological origin but excludes material that is found embedded in geological and/or fossil formations. Examples of biomass are: (all or parts of) plants, trees, algae, marine organisms, microorganisms, animals, etc.*

****Secondary raw materials are defined here as residual products from other production processes, such as waste products from the food industry, by-products such as straw from grain production, by-products from maize and dried palm leaves. PFAD from palm oil is not counted as a residual/waste product.*

- ✉ Description of the packaging from the packaging producer showing percentage (by weight) of paperboard material, barrier material (material type, whether it is bio-based or PCR and percentage) and other elements such as closure (material type, whether it is bio-based or PCR and percentage). Appendix 5 can be used.

- ✉ The producer of the packaging shall document, for instance based on invoice or delivery note, that the requirement of minimum 70% certified paper/paperboard is purchased on a yearly basis, and that the remaining proportion is covered by the FSC/PEFC control schemes.

- ✉ Calculation showing that the requirement for the proportion of bio-based or recycled material in the primary packaging is fulfilled. Appendix 5 can be used.

- ✉ Declaration that palm oil and soy has not been used. Appendix 5 can be used.

- ✉ For sugar cane: Copy of valid CoC certificate or certification number. The CoC certificate holder shall declare that all sugar cane used in the plastic for the cardboard packaging that is used for the Nordic Swan Ecolabelled product is certified according to a specified standard. The standard must meet Nordic Ecolabelling's requirements for raw material standards. A mass balance approach is permitted.

- ✉ Declarations that PVC and other plastic based on other types of halogenated plastics has not been used. Appendix 5 can be used.

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

- ✉ Declaration that direct printing on cardboard in the packaging is done with water-based inks. Appendix 5 can be used.

- ✉ For packaging that is Nordic Swan Ecolabelled according to the criteria for Nordic Ecolabelling for Packaging for Liquid Foods: Please state the Nordic Swan Ecolabel licence number.

Background to requirement O23

There seems to be an emerging trend towards liquid chemical-technical products in cardboard packaging. Nordic Ecolabelling will allow the most environmental friendly packaging within this format to be used for Nordic Swan Ecolabelled products.

The availability of liquid packaging board with PCR materials is very limited. Hence, we accept bio-based material as an alternative to PCR. The requirement promotes sustainable, renewable raw materials (both paper/paperboard and bio-based plastics) as an alternative to PCR plastics. The requirement of minimum 60% paper/board is set to ensure a relatively high content of paper/board, which is material recycled in Norway, Sweden and Finland. The plastic fraction of the liquid packaging board is currently not being material recycled.

PVC and other halogenated plastics are excluded since they lead to adverse environmental impacts in waste handling. Even though aluminium from liquid

packaging board is currently separated and material recycled[54], it is excluded due to the energy consumption required in the recirculation process.

Direct print instead of labels, and use of water-based inks when printing on cardboard is preferable in the recycling process [55], as non-water-based inks will remain on the fibres in the cardboard and will lower the quality and safety of the resulting recycled fibres. However, non-water-based inks are allowed for print on the plastic layer of the packaging as the printing ink will remain with the plastic polymer, which is not recycled.

This is a new requirement.

O24 Weight-Utility Ratio (WUR)

The product's weight-utility ratio (WUR) must not exceed the limit values in the table below.

Limit values for WUR

Product type	WUR [g/wash]
Dishwasher detergents in rigid plastic-based packaging	1.8
Dishwasher detergents in flexible plastic pouches	1.0
Solid dishwasher detergents in cardboard and corrugated board packaging	2.1
Liquid dishwasher detergents in cardboard packaging	1.8
Rinse aids	0.35*

* *Rinse aid is calculated at a dose of 3 ml.*

Packaging with both plastic and carboard that can be manually separated (e.g. bag in a box or cardboard box with a plastic closure or handle) need to use a weighed calculation that takes into account both materials. This kind of packaging, consisting of X% plastic and Y% cardboard must fulfil the WUR-limit X/100*WUR (plastic-based packaging) + Y/100*WUR (paper-based packaging).

The WUR is calculated only for primary packaging (container, closure, labels, including handles etc.) using the formula below:

$$WUR = \Sigma [(Wi + Ui)/(Di * ri)]$$

Where:

Wi = the weight (g) of the packaging component (i) including the label if applicable.

Ui = the weight (g) of non-recycled (virgin) material in the packaging component (i). If the proportion of recycled material in the packaging component is 0 % then Ui = Wi.

Di = the number of functional units contained in the packaging component (i).

ri = recycling figure, i.e. the number of times the packaging component (i) is used for the same purpose through a return or refill system. The default value for r is set to 1 (= no re-use). Only if the applicant can document that the

[54] Information from Fiskeby Board AB
[55] Personal communication with Cecilia Halling Linder, Fiskeby Board AB (December 2020)

packaging component is re-used for the same purpose and how many times, a higher value for r can be used in the calculation.

✉ Declaration/documentation from the packaging manufacturer stating the type of material in the packaging components (e.g. closure, bottle and labels), as provided through requirement O19-O23. Appendix 4 or 5 can be used.

✉ Declaration from the packaging manufacturer about the proportion of recycled material, if recovered/recycled material is used, as provided through requirement O19-O23. Appendix 4 or 5 can be used.

✉ Calculation of weight-utility ratio (WUR) and required documentation on reuse of the packaging component. Nordic Ecolabelling's calculation sheet can be used and can be obtained from https://www.nordic-swan-ecolabel.org/criteria/dishwasher-detergents-and-rinse-aids-017/ or Nordic Ecolabelling's national websites.

Background to requirement O24

A MECO analysis (cf. the chapter on "Environmental impact of dishwasher detergents and rinse aids") highlights distribution of the products as one key parameter. This is relevant to the requirements on WUR and fill ratio. The purpose of the weight-utility ratio (WUR) is to reduce the amount of packaging and promote the use of recycled materials, helping to ensure a reduction in transport of packaging and air, and so lower CO_2 emissions. This restriction promotes the use of concentrated products by relating the amount of packaging to the dose.

The limit values of the requirement have been tightened compared to generation 6. Further, they have been differentiated based on different product and packaging types. The new limit values are based on current licence data. The new requirements of minimum levels of recycled material have also been considered when setting the WUR limits.

Liquid dishwasher detergents in cardboard packaging: The WUR-limit is set on the same level as for rigid plastic packaging, as this packaging is the main alternative for liquid products.

For rinse aids, currently the only product and packaging type in use is liquids in rigid plastic-based packaging. If other packaging types are used (e.g. cardboard packaging), the product must fulfil the same WUR-limit value.

O25 Fill ratio

The product's fill ratio must exceed the limit values in the table below.

Limit values for fill ratio

Product type	Fill ratio [doses/litre]
Solid dishwasher detergents in rigid plastic-based packaging	40
Liquid dishwasher detergents in rigid plastic-based packaging	55
Dishwasher detergents in flexible plastic pouches	25
Solid dishwasher detergents in cardboard and corrugated board packaging	30
Liquid dishwasher detergents in cardboard-based packaging	55

Rinse aid is exempted from this requirement.

The fill ratio is the ratio between the number of doses and the volume of the packaging in litres. It is to be calculated for all sizes of packaging for the same product variant (multifunctional and single functional dishwasher detergents).

✉ Calculation of the fill ratio.

Background to requirement O25

A MECO analysis (cf. the chapter on "Environmental impact of dishwasher detergents and rinse aids") highlights distribution of the products as one key parameter. This is relevant to the requirements on WUR and fill ratio.

The fill ratio limit values have been differentiated based on different product types, in accordance with the categorization in the WUR criterion, but with the limit value for dishwasher detergents in rigid plastic packaging divided into two separate product types for solid and liquid detergents. This is a change compared to generation 6. The new limit values are based on the licence data within the respective product types.

The fill ratio for liquid dishwasher detergents in cardboard-based packaging (new packaging format) is set equal to the value for rigid plastic-based packaging, which is the packaging format currently used for liquid/gel products.

Since rinse aids are sold as liquid products in "full plastic bottles" and do not contain a specific number of doses, this requirement is not deemed relevant for rinse aids, and they are exempted from this requirement.

2.7 Consumer guidance

Consumer behaviour is an important factor influencing the burdens in the life cycle of detergents and cleaning products. Nordic Ecolabelling would therefore like to help the consumers towards a more sustainable machine dishwashing routine, by providing information on how to limit energy and resource consumption, as well as how to recycle the packaging.

O26 Dosage instructions

The following must be stated clearly on the label of dishwasher detergents:

- The recommended dosage* must be stated for soft water (0-6° dH).
- A recommendation to use salt to soften the water in the dishwasher in areas with hard water.
- Information stating that the product is efficient at /from 45°C (or lower if tested at a lower temperature).

** Recommended dosage for soft water must be identical to the dosage used in the performance test.*

For products marketed in several Scandinavian countries (Sweden, Denmark, Norway), instructions in one Scandinavian language is accepted.

Exemptions:

If multifunction products meet the performance requirement at higher water hardness without added salt in the machine, the recommendation about salt does not need to be given.

The text on water softener is not required in Norway.

✉ Sample label.

Background to requirement O26

Nordic Ecolabelling believes that the risk of overdosing is reduced when the instructions are clear and correlate with the dose at which the product is effective. Nordic Ecolabelling set requirements for dosing only in soft water in combination with a recommendation of the use of salt in hard water areas, to avoid misunderstandings and overdosing.

The dosage must be stated for soft water as most parts of the Nordic countries have soft water. Use of salt will ensure soft water in the dishwasher also in hard water areas.

The required statement regarding "effective from" has been updated with the new lower temperature of 45 °C, as this is the temperature/setting used in the performance test. Nordic Ecolabelling includes this to make the environmental gains larger, by informing the consumer that the product works at lower temperatures.

O27 Washing guidance on packaging

The following recommendations for a sustainable dishwashing procedure must be stated on the label of dishwasher detergents:

- Scrape large leftovers from dishes and cutlery. Rinsing is not necessary.
- Fill up the dishwashing machine completely before start.
- Follow the dosing instructions.
- Choose eco-program.

For products marketed in several Scandinavian countries (Sweden, Denmark, Norway), guidance in one Scandinavian language is accepted.

Rinse aids are exempted from the requirement.

✉ Sample label.

Background to requirement O27

Consumer behaviour is one of the most important factors influencing the burdens in the life cycle of detergents and cleaning products[56] and energy in the usage phase stands out as the largest parameter according to the MECO analysis described in the section "Environmental impact of dishwasher detergents and rinse aids". Up to 50% of consumers in Sweden rinses their dishes prior to loading[57]. Rinsing is not necessary according to the dishwasher manufacturers[58,59] and results in unnecessary consumption of resources (water as well as energy if hot water is used).

A.I.S.E., the International Association for Soaps, Detergents and Maintenance Products has investigated dish care habits in a survey from 2020. Here, they

[56] International Akademie Fresenius Conference "Detergents and Cleaning Products", 2.-3. Dec. 2020.
[57] JRC Technical Report. Ecodesign and Energy Labels for Household Dishwashers (2017). https://www.applia-europe.eu/images/Library/Review_Study_on_Domestic_Dishwashers_-_2017-compress.pdf (Accessed 2020-12-11).
[58] Miele Instruction Manual https://www.miele.dk/pmedia/ZGA/TX2070/10383831-000-01_10383831-01.pdf (Accessed 2020-12-18).
[59] JRC Technical Report. Ecodesign and Energy Labels for Household Dishwashers (2017). https://www.applia-europe.eu/images/Library/Review_Study_on_Domestic_Dishwashers_-_2017-compress.pdf (Accessed 2020-12-11).

found that the average dishwashing machine runs 4.9 washes per week with a filling level of the machine on 88%[60]. However, Richter (2010)[61] revealed that less than 40% of machines that were reported as "full" by consumers, were actually filled to their full capacity. There is thus room for improvement, both regarding pre-wash rinsing and filling of the dishwashing machines. Nordic Ecolabelling would like to help the consumers towards a more environmentally friendly dishwasher routine, by providing information on how to limit energy and resource consumption. This is also supported by the A.I.S.E. survey, which found that a large part of the consumers would like detergent producers to provide more information on how to use the product in a more sustainable way[62].

Nordic Ecolabelling believes that the risk of overdosing is reduced when the instructions are clear and correlate with the dose at which the product is effective. Eco-programs are recommended as they save energy and water.

The wording of the recommendations may be rephrased, as long as the message is clear. Pictograms can be accepted.

This is a new requirement.

O28 Information on recycling

The product label must include information on how to sort the packaging for recycling after use. If there are differences between the Nordic countries, correct sorting in each country of sale must be communicated. The common Nordic pictogram system 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/

✉ Sample label showing the recycling information.

Background to requirement O28

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

We are aware that the introduction of the common Nordic pictogram system in Finland is still only under discussion[63]. However, we want to support the system, which already appears to be widely in use on food packaging. Alternative ways of

[60] A.I.S.E.'s pan-European habits survey 2020. https://www.aise.eu/documents/document/20200917130851-aise_consumerhabitssurvey_2020_highlights.pdf (Accessed 2020-12-15).
[61] Richter, C. (2010) In-house consumer study on dishwashing habits in four European Countries. Cited by JRC Technical Report. Ecodesign and Energy Labels for Household Dishwashers (2017). https://www.applia-europe.eu/images/Library/Review_Study_on_Domestic_Dishwashers_-_2017-compress.pdf (Accessed 2020-12-11).

[62] A.I.S.E.'s pan-European habits survey 2020. https://www.aise.eu/documents/document/20200917130851-aise_consumerhabitssurvey_2020_highlights.pdf (Accessed 2020-12-15).
[63] https://verkkolehti.rinkiin.fi/nordic-recycling-symbols-link-packaging-to-collection-containers?lang=en#757b186d (Accessed 2021-01-21)

communicating the sorting instructions are allowed. The alternative communication should be done in an equally clear way for the consumer. E.g. “sort as plastic packaging” should be used instead of the term PE-HD, as “plastic packaging” is the fraction that the consumer relates to.

2.8 Licence maintenance

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

O29 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 O29

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.

O30 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 O30

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.

3 Changes compared to previous generation

The most important changes compared with the previous generation are listed in the table below.

Table: Overview of changes to criteria for generation 7 compared with previous generation 6.

Proposed requirement generation 7	Requirement generation 6	Same requirement	Change	New requirement	Comment
O1	O1	x			
O2	O2		x		Ban on H420 and restriction on EUH208.
O3				x	
O4	O3 and O4				The generation 6 requirements O3 CMR substances and O4 Sensitizing substances have been merged into one requirement.
O5	O8		x		Adjusted and is now in line with other more recent criteria for cleaning products and detergents.Phosphates has been added to the list.
O6	O7	x			
O7	O9		x		Fragrance is not permitted in rinse aid anymore. Fragrance added to the packaging must now also be taken into account. Moreover, adjusted and is now in line with other more recent criteria for cleaning products and detergents.
O8	O5	x			
O9	O10	x			
O10	O15	x			
O11	O6		x		The limit values have been tightened.
O12	O14		x		CDV is calculated only with chronic values. The limit values have been tightened for all three categories.
O13	O12	x			
O14				x	
O15	O13	x			
O16	O22		x		Updated to IKW2015, and updated Nordic Swan specific modifications.
O17				x	
O18 – O23				x	
O24	O18		x		The limit values of the requirement have been tightened compared to generation 6. Further, they have been differentiated based on different product and packaging types.
O25	O19		x		The limit values of the requirement have been tightened compared to generation 6. Further, they have been differentiated based

					on different product and packaging types.
O26	O16		x		Temperature lowered to 45ºC.
O27				x	
O28	O20		x		The common Nordic pictogram is promoted, but not mandatory.
O29-O30	O23-O28		x		
	O11, O17, O21				These requirements have been removed.