Nordic Ecolabelling for Industrial cleaning and degreasing agents

Generation 4 • 12 September 2025 – 28 February 2030

Nordic Ecolabelling

Contents

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

info@ecolabel.dk

www.svanemaerket.dk

Iceland

Ecolabelling Iceland

svanurinn@uos.is

www.svanurinn.is

Finland

Ecolabelling Finland

joutsen@ecolabel.fi

www.joutsenmerkki.fi

Norway

Ecolabelling Norway

hei@svanemerket.no

www.svanemerket.no

Sweden

Ecolabelling Sweden

info@svanen.se

www.svanen.se

1 Justification of the product group definition

Further background for the product group definition

The criteria for industrial cleaning and degreasing agents previously applied only to products intended for indoor use. Since generation 3 of the criteria, the product group encompasses industrial cleaning and degreasing agents for both indoor and outdoor use within industrial settings. This broader scope allows for a wide variety of products to qualify for the Nordic Swan Ecolabel. The range includes for example, cleaning pipe systems (CIP; clean in place), alkaline micro-emulsions, component cleaning agents, and deep cleaning agents designed for tasks such as cleaning oily surfaces, engines, machinery, workshop floors, tanks and cargo holds on ships.

Despite the varied applications, the primary function of industrial cleaning and degreasing agents remains consistent: To remove soiling such as oil residues, wax, grease, dust, graffiti paint and other types of dirt from surfaces, machine parts, tools and pipe systems made of materials like steel, aluminium, concrete and plastic. The products must be exclusively intended for professional use.

In terms of façade cleaning, products to specialized services like graffiti removal and cleaning of solar modules are included in this product group, while products to ordinary routine façade cleaning are covered under PG 026 Cleaning products.

All types of graffiti removers are included in this product group, including those for vehicles such as trains and other rail transport.

2 Summary

The product group comprises products that are primarily intended to remove soiling such as oil residues, wax, grease, dust, graffiti paint and other types of dirt from surfaces, machine parts, tools and pipe systems made of materials like steel, aluminium, concrete and plastic. This allows for a wide variety of products to qualify for the Nordic Swan Ecolabel. For example, cleaning pipe systems, alkaline micro-emulsions, component cleaning agents, and deep cleaning agents designed for tasks such as cleaning oily surfaces, engines, machinery, workshop floors, tanks and cargo holds on ships.

The relevant environmental impacts found in the life cycle of industrial cleaning and degreasing agents are the following: Degradability and toxicity to aquatic organisms, exposure of chemicals harmful to health, emission of VOC, eutrophication from phosphorous compounds, user information, dosing and performance and packaging. The criteria contain requirements in those areas.

The most important changes from the previous generation of the criteria are:

- Cleaners for solar modules have been included in the product group and assigned specific limit values for CDV and degradability.
- The new EUH hazard classifications for endocrine disruptors, PBT/vPvB, and PMT/vPvM have been added to both the list of prohibited product classifications and the list of prohibited classifications for ingoing substances.

- Hazard classifications for specific target organ toxicity due to repeated exposure (STOT RE 1) and substances hazardous to the ozone layer have been added to the prohibited classifications for ingoing substances. The exception stating that preservatives present at <0.01% by weight in the final product and enzymes in liquid form or as solid granulates (including stabilisers in enzyme raw materials) may be classified as H334 or H317 has been removed.
- The list of substances that are excluded from use in products has been extended.
- A ban on microplastics has been introduced.
- The requirements for potential or identified endocrine disruptors, nanomaterials/-particles, and PBT and vPvB substances have been updated.
- The definition of VOC has been updated according to the Industrial Emissions Directive (IED) 2010/75/EU.
- Surfactants classified as H411 and H412 are no longer exempt from the requirement on long-term environmental effects. Additionally, the multiplying factor M for H410, as described in the CLP Regulation (EC) No 1272/2008, has been included in the calculation.
- The limit values for CDV have been tightened and the exemption for hydrochloric acid has been removed.
- A new requirement has been introduced for primary packaging up to 20 litres, ensuring recyclability.

2.1 Changes compared to previous generation

Here, the most important changes compared to the previous generation are briefly listed.

Table 1 Overview of changes to criteria for Industrial cleaning and degreasing agents generation 4 compared with previous generation 3

Proposed requirement generation 4	Requirement generation 3	Same req.	Change	New req.	Comments
O1 Description of the product	O1 Information about the product	X			
O2 Classification of the product	O2 Classification of the product		X		The new EUH hazard classifications for endocrine disruptors, PBT/vPvB, and PMT/vPvM have been added to the prohibited classifications.
O3 Classification of ingoing substances	O3 Classification of constituent substances in the product		X		The new EUH hazard classifications for endocrine disruptors, PBT/vPvB, and PMT/vPvM have been added to the prohibited classifications. Additionally, hazard classifications for specific target organ toxicity due to repeated exposure (STOT RE 1) and substances hazardous to the ozone layer have been added to the prohibited

					classifications for ingoing substances. The exception stating that preservatives present at <0.01% by weight in the final product and enzymes in liquid form or as solid granulates (including stabilisers in enzyme raw materials) may be classified as H334 or H317 has been removed.
O4 Surfactants	O10 Surfactants, readily aerobically and anaerobically degradable	X			
O5 Preservatives	O5 Preservatives		X		Updated according to Nordic Ecolabelling's policy on preservatives. A Challenge test is no longer required.
O6 Organic colorants	O6 Dyes	X			
O7 Volatile organic compounds (VOC)	O7 Volatile organic compounds (VOC)		X		The definition of VOC has been updated according to the Industrial Emissions Directive (IED) 2010/75/EU.
O8 Phosphorus	O8 Phosphorus	X			
O9 Excluded substances	O9 Substances that must not be present in the products		X		The list of substances that are excluded from use in products has been extended with: • Aminopolyphosphonates • Bisphenols and bisphenol derivatives • Boric acid, borates, and perborates • Isothiazolinones • LAS (linear alkylbenzene sulphonates) • NTA (nitrilotriacetic acid, CAS No. 139-13-9) and its salts • Per- and polyfluoroalkyl substances (PFAS) • Siloxanes D4, D5, D6 and HMDS The requirements for potential or identified endocrine disruptors and PBT and vPvB substances have been updated.
O10 Microplastics				X	
O11 Nanomaterials	O9 Substances that must not be present in the products		X		The requirement has been updated.
O12 Long-term environmental effects	O4 Environmentally harmful substances		X		Surfactants classified as H411 and H412 are no longer exempt from the requirement.

					The unit has changed from % in product to grams/litre in-use solution. The requirement is set per product type. The multiplying factor M for H410, as described in the CLP Regulation (EC) No 1272/2008, has been included in the calculation.
O13 Degradability	O11 Aerobic degradability, aNBO and Anaerobic degradability, anNBO		X		The use of organic substances that are aerobically non-biodegradable (aNBO) is not permitted in cleaners for solar modules.
O14 Critical dilution volume (CDV)	O12 CDV (critical dilution volume)		X		The limit values have been tightened and the exemption for hydrochloric acid has been removed.
O15 Performance	O13 Performance test – user reports and O14 Performance test – laboratory test	X			
O16 User information	O17 Information for users		X		For graffiti removers: The product label or accompanying product sheet must include information on how to handle remediated paint from graffiti removal.
O17 Packaging				X	A new requirement has been introduced for primary packaging up to 20 litres, ensuring recyclability.
O18 Customer complaints	O20 Quality of the cleaning agent		X		
O19 Traceability	O23 Traceability		X		

3 Justification for requirements

3.1 General requirement area

Background to requirement O1 Description of the product

A description of the product and its area of use is required to assess whether the product falls within the product group definition. Nordic Ecolabelling needs to know the complete formulation, with all ingoing raw materials and ingoing substances in each raw material. This is necessary to control the individual requirements below and make the calculations necessary in respect of each requirement.

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

Background to requirement O2 Classification of the product

Nordic Ecolabelling sets requirements regarding environmental and health classifications of the product to ensure that products that are toxic or harmful to the environment and/or human health cannot be awarded the Nordic Swan Ecolabel. The list includes classifications that are standard to include in all product groups if we do not get information that they are irrelevant, as we apply the precautionary principle.

An analysis of the classification of industrial cleaning and degreasing agents that are not Nordic Swan Ecolabelled reveals that several products are classified as hazardous to aquatic environment. This underscores the importance and potential of the classification requirement.

The requirement has changed compared to generation 3 of the criteria regarding the following: The Nordic Swan Ecolabel has included the new EUH CLP classifications to align with the European Green Deal's goal of a toxic-free environment. This inclusion reflects the need to establish hazard identification for endocrine disruptors and addresses criteria for environmental toxicity, persistency, mobility and bioaccumulation. By incorporating these classifications, Nordic Swan Ecolabel ensures that the criteria relate to up-to-date scientific understanding and regulatory compliance. Additionally, the inclusion of PMT and vPvM substances is crucial due to their persistence, mobility and potential impact on water quality. The Nordic Swan Ecolabel aims for comprehensive hazard identification and protection of the environment and human health.

Background to requirement O3 Classification of ingoing substances

Excluding carcinogenic, mutagenic, reproduction toxic (CMR), sensitizing substances and specific target organ toxicity, repeated exposure STOT RE 1 is an important parameter from a health perspective. Excluding substances that are hazardous to the ozone layer is an important parameter from an environmental perspective.

For exemption NTA: See background to requirement O9 (Excluded substances). The requirement has changed compared to generation 3 of the criteria regarding the following:

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

Additionally, hazard classes for specific target organ toxicity, repeated exposure (STOT RE 1), and substances that are hazardous to the ozone layer have been added to the prohibited classifications.

The exception stating that preservatives present at <0.01% by weight in the final product and enzymes in liquid form or as solid granulates (including stabilisers in enzyme raw materials) may be classified as H334 or H317 has been removed.

Background to requirement O4 Surfactants

Surfactants are used in large quantities in industrial cleaning and degreasing agents, making the products functional and effective. Many surfactants are hazardous to aquatic organisms. The Detergent Regulation[1] generally requires that all surfactants must be readily biodegradable. If a substance does not meet this requirement and is intended solely for professional use, an exemption can be requested, allowing the substances to only be potentially biodegradable. The requirement for anaerobic biodegradability is considered a baseline, in line with the position of Nordic Ecolabelling, which asserts that environmentally harmful substances should be capable of degrading regardless of the environment they end up in. This is deemed relevant as surfactants have been found in sludge intended for use as fertilizer on land. The presence of these substances suggests that degradation in sludge or soil is not guaranteed, even though they may be biodegradable in aerobic aquatic environments. Since these criteria apply only to professional use and an exemption from the Detergent Regulation can be requested for such products, it is relevant to require both aerobic and anaerobic biodegradability for surfactants.

The requirement excludes linear alkylbenzene sulphonates (LAS) as they are not anaerobically biodegradable.

According to a specific Norwegian regulation[2], substances in products intended for offshore use, where there is a risk of direct release into the ocean, must be tested in accordance with Test No. 306 in OECD Guidelines for the Testing of Chemicals, a test designed for saltwater environments.

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

Background to requirement O5 Preservatives

Preservatives are typically harmful to aquatic organisms and can cause sensitivity and allergic reactions. Many products within this category do not need preservatives because they are acidic or basic. Still, preservatives are added to neutral, liquid products to prevent the growth of bacteria. Preservatives are essential for extending the shelf life of these products.

Preservatives may be included in both the final product and the ingoing substances, provided they are not bioaccumulative.

The requirement has changed since generation 3 of the criteria, and a Challenge test is no longer required. This is line with the Nordic Ecolabelling policy on preservatives.

Background to requirement O6 Colorants

In professional products, colorants may be used for colour coding to ensure the correct application of the products, in other words for safety reasons. Although colorants are used in very small amounts, they often possess undesirable environmental properties, such as being non-readily degradable. Therefore, Nordic Ecolabelling allows colorants that are considered non-bioaccumulative.

[1] Regulation (EC) No 648/2004, 2004.
[2] Harmonised Offshore Chemical Notification Format OSPAR Recommendation 2010/13 (Update 2023), Supplementary guideline for the Norwegian sector.

When colourants are approved for use in food, their safety is evaluated by the European Food Safety Authority (EFSA). The evaluation discusses absorption, distribution, metabolism, and excretion (ADME) in line with various animal tests. Based on the ADME study and other toxicity data, such as gene toxicity or sensitisation, EFSA establish ADI (Acceptable Daily Intake) values for the colorants approved for use in food. Nordic Ecolabelling relies on the EFSA's evaluation that it is likely that highly bioaccumulating colours will not be approved for use in food. Therefore, based on our own study described above where log Kow or BCF values were lacking, we also accept E-numbers as documentation of low bioaccumulation potential.

Background to requirement O7 Volatile organic compounds (VOC)

Volatile organic compounds (VOCs) are of particular concern due to their inherent properties. They can be absorbed through the lungs and skin, potentially causing damage to various organs. Prolonged exposure to certain organic solvents may result in chronic damage to the brain and nervous system, while others have been linked to cancer and reproductive harm. Additionally, solvents can cause headaches, eye irritation, and respiratory issues. VOCs also contribute to ground-level ozone formation and are often slow to degrade in ecosystems, leading to long-term environmental impacts.

Many industrial cleaning and degreasing agents, particularly those designed to remove heavily oiled dirt from surfaces, contain volatile organic compounds. Nordic Ecolabelling consistently aims to limit the content of VOCs, while recognizing that these compounds sometimes play a crucial role in ensuring product effectiveness.

Based on Nordic Ecolabelling's experience, solvent-based products demonstrate varying properties, with some presenting more significant health and environmental risks than others. Many solvent-based products on the market contain aromatic hydrocarbons or are classified as environmentally hazardous. Nordic Ecolabelling aims to encourage the use of safer solvents and therefore sets specific requirements for solvent-based products. Organic solvents with a vapor pressure exceeding 2.5 kPa at 20°C are entirely prohibited. The limit of 2.5 kPa at 20°C was determined by examining the vapor pressure and aromatic content of over 30 cleaning agents based on organic solvents used in the graphics industry. Of these agents, only four meet the requirements for both vapor pressure (< 2.5 kPa) and aromatic content. To reduce the exposure of the products, the product label or accompanying product sheet must include health and safety instructions emphasizing the importance of ventilation during use of the product. In addition, products classified as environmentally harmful are prohibited by requirement O2 (Classification of the product), halogenated and aromatic solvents are prohibited by requirement O9 (Excluded substances) and requirement O13 (Biodegradability) limits the quantity of aerobically and anaerobically non-biodegradable substances.

In other products the VOC content must not exceed 1% by weight in the in-use solution at the maximum recommended dosage.

The division between solvent based and other products

A solvent-based product uses a liquid organic solvent to carry its active ingredients. The solvent helps dissolve or spread these ingredients evenly, making them work effectively. Once applied, the solvent usually evaporates, leaving the active ingredients on the surface.

In other products water acts as a carrier for VOCs by dissolving or dispersing these ingredients in a water-based solution.

Graffiti removers must be classified under “other products” for the purposes of this requirement. Professional graffiti removers typically contain little to no water and are supplied as ready-to-use products. Since the market already demands VOC-free formulations, they should always comply with the “other products” criterion, with a VOC limit of 1% by weight, regardless of whether they contain water or are ready-to-use.

The requirement has changed since generation 3 of the criteria to update the definition of VOC in accordance with the Industrial Emissions Directive (IED) 2010/75/EU.

Background to requirement O8 Phosphorus

Phosphorus and nitrogen are the primary nutrients driving eutrophication. This process depletes oxygen in lakes, oceans, and watercourses, leading to the formation of dead zones. In addition, phosphorus is a non-renewable resource facing continuously rising demand, and it can only be sourced from phosphorite, which is found in only a few countries—many of which have unstable regimes. Aside from Morocco, several of these countries are already nearing depletion of extractable phosphorus[3].

Phosphate, a chemical form of the element phosphorus, acts as a complexing agent for lime and serves as an auxiliary chemical for surfactants. Phosphonates are a group of phosphorus compounds known for their excellent complexing properties.

Phosphorus is not permitted in products intended for outdoor use, as these products may be carried directly into the water recipient rather than reaching a wastewater treatment plant. An exception to this requirement applies to products used offshore, where a limited amount of phosphorus is allowed. International regulations established by the IMO (International Maritime Organization) govern the discharge of tank wash water in coastal areas, among other things. In international waters, the presence of phosphates in cleaning products is permitted and accepted. However, the conditions and risks of eutrophication differ in these areas compared to coastal areas, watercourses, and lakes. Therefore, products intended for use in these areas must not contain phosphorus.

For indoor-use products, the use of phosphorus is allowed in limited quantities.

Phosphonates are persistent and neither aerobically nor anaerobically degradable. Therefore, the restrictions on phosphorus content also apply to phosphorus originating from phosphonates.

The requirement is unchanged compared to criteria generation 3.

[3] Når det er tomt her - er verden ille ute | DN (Accessed on 25 October 2024).

Background to requirement O9 Excluded substances

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

The requirement is updated compared to generation 3 of the criteria.

Alkylphenols (AP) (e.g. butylated hydroxy anisole (BHA, CAS No. 25013-16-5), alkylphenol ethoxylates (APEO), and other alkylphenol derivates (APD)

Alkylphenols is a group of mainly non-ionic surfactants that are produced in large volumes and their use leads to widespread release to the aquatic environment. APEOs are highly toxic to aquatic organisms and degrade to more environmentally persistent compounds (APDs). Ethoxylated nonylphenol and several other alkylphenols are included in the Candidate List due to endocrine disrupting properties. Other alkylphenols are polyalkylated phenols such as butylated hydroxytoluene (BHT) and butylated hydroxyanisole (BHA) which have antioxidant properties. APEO and APD are also excluded from use through requirement O4 (Surfactants). The requirement is updated compared to generation 3 of the criteria.

Aminopolyphosphonates

Aminopolyphosphonates are for example used in laundry detergents. An analysis hypothesize that glyphosate may also be a transformation product of aminopolyphosphonates. Glyphosate is suspected of causing genetic damage. Glyphosate is acutely toxic to fish and birds and can kill beneficial insects and soil organisms that maintain ecological balance. Laboratory studies have identified adverse effects of glyphosate-containing products in all standard categories of toxicological testing.[4] This is a new requirement in generation 4 of the criteria.

Aromatic solvents

Aromatic solvents are harmful to health, often not readily biodegradable and can have negative effects on the earth’s ozone layer. Some aromatic solvents are suspected of causing cancer. The requirement is unchanged compared to criteria generation 2.

Solvents in Nordic Swan Ecolabelled graffiti removers may contain ≤ 5000 ppm aromatic hydrocarbons as a residue from the purification / refining process. In this way, Nordic Ecolabelling distinguishes products with a low aromatic content in relation to products that contain cheaper bulk raw materials where the aromatic content is higher. Note that if the product contains several different solvents, all of them must meet the requirement of ≤ 5000 ppm aromatic hydrocarbons as a residue from the purification / refining process.

Benzalkonium chloride (CAS No. 8001-54-5, 63449-41-2 and others)

Benzalkonium chlorides (BACs) is part of a group of chemicals with wide applications due to their antimicrobial properties against bacteria, fungi and viruses. There is a risk that frequent

[4] Glyphosate contamination in European rivers not from herbicide application? - ScienceDirect

and widespread use of BACs in commercial products can generative selective environments for microbes and contribute to resistance to antibiotics. Furthermore, there is a risk to consumer exposure due to their toxicity and allergenic properties. The requirement is unchanged compared to criteria generation 3.

Bisphenols and bisphenol derivatives belonging to the group of 34 substances that have been identified by ECHA for further EU regulatory risk management that are known or potential endocrine disruptors for the environment of for human health, or that can be identified as toxic for reproduction

Several bisphenols with the general bisphenol structure and 'bisphenol derivatives' which have constituents with structural properties common to bisphenols are now prohibited. Based on the potential for widespread use and available information on potential endocrine disruptors, reproductive toxicity and PBT/vPvB properties, 34 substances (see in the requirement) were identified in need for further regulatory risk management in EU. This is a new requirement in generation 4 of the criteria.

Boric acid, borates, and perborates

Perborates are sometimes used as bleaching agents. Many perborates are classified as toxic for reproduction. Nordic Ecolabelling wishes to continue listing these as prohibited, despite them also being banned under requirement O3 (Classification of ingoing substances). This is a new requirement in generation 4 of the criteria.

Ethylenediamine tetraacetate (EDTA, CAS No. 6381-92-6) and its salts and Diethylenetriamine pentaacetate (DTPA, CAS No. 67-43-6) and its salts

EDTA, DTPA and their salts are not readily degradable. Furthermore, DTPA is classified toxic for reproduction and may potentially pose a risk to consumers. for EDTA, the EU’s risk assessment states that under the conditions at municipal water treatment plants EDTA is either not broken down or only breaks down to a slight degree. To-date in Europe, EDTA has been replaced in virtually all consumer products by readily biodegradable alternatives such as MGDA (methylglycine diacetic acid) and GLDA (glutamic acid diacetic acid). The requirement is unchanged compared to criteria generation 3.

Fragrances

Fragrance substances are often not easily biodegradable and many are ecotoxic and sensitizing. The requirement is unchanged compared to criteria generation 3.

Halogenated organic compounds

Halogenated organic compounds, including short-chain chlorinated paraffins (C10-C13), medium-chain chlorinated paraffins (C14-C17) , chlorophenols and dimethyl fumarate derivates, is a large group of substances that are harmful to both the environment and human health. They are often carcinogenic, highly toxic to aquatic organisms and very persistent to degradation.The requirement is unchanged compared to criteria generation 3.

Isothiazolinones (e.g. methylisothiazolinone (MIT), CAS No. 2682-20-4, metylchloroisothiazolinone (CMIT), CAS No. 26172-55-4, C(M)IT/MIT (3:1), CAS No. 55965-84-9, benzisothiazolinone (BIT), CAS No. 2634-33-5, octylisothiazolinone (OIT), CAS No. 26530-20-1 and dichlorooctylisothiazolinone (DCOIT), CAS No. 64359-81-5)

Allergies to preservatives, particularly MI (methylisothiazolinone, CAS No. 2682-20-4) have risen in recent years and Nordic Ecolabelling does not want to contribute towards unnecessary exposure. This is a new requirement in generation 4 of the criteria.

LAS (linear alkylbenzene sulphonates)

Linear alkylbenzene sulphonates (LAS) are toxic to aquatic organisms and are not biodegradable in an anaerobic environment. LAS is already excluded through requirements for surfactants, but for the sake of clarity it is now also included in this requirement.

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

NTA (nitrilotriacetic acid, CAS-no. 139-13-9) is an anthropogenic substance and does not naturally occur in the environment and is present in the environment as a result of its release in sewage from processing. NTA is considered to be persistent and is suspected carcinogenic. Complexing agents that replace NTA (GLDA and MGDA) contain small quantities of NTA as residues from raw material production (as attested in various safety data sheets for the raw materials). To encourage a transition to MGDA and GLDA, they may contain NTA impurities in the raw material in concentrations of less than 0.2% if the concentration of NTA in the product is below 0.1%. This is a new requirement in generation 4 of the criteria.

Organic chlorine compounds, hypochlorous acid and hypochlorite

Organic chlorine compounds, hypochlorite and hypochlorous acid can be used as disinfecting and antibacterial substances and as bleaching agents. Chlorine-based substances generally have undesirable health and environmental properties. Both hypochlorite and hypochloric acid can lead to formation of organic chlorine compounds and byproducts that are toxic and bioaccumulative, like trihalomethanes and haloacetic acids. Hypochlorous acid is not classified, and hypochlorite have the classification Very toxic to aquatic life (H400) and thus, they are not covered by the general requirement concerning environmentally hazardous substances. However, both pose an environmental risk due to the possibility of organic chlorine compounds forming. The requirement is unchanged compared to criteria generation 3.

PBT and vPvB substances in accordance with REACH Annex XIII, including substances under investigation according to the ECHA PBT assessment list
https://echa.europa.eu/da/pbt

PBT and vPvB are abbreviations for substances that are persistent, bioaccumulative and toxic, and very persistent and very bioaccumulative, respectively, in accordance with REACH Annex XIII. This means that they are not biodegradable and that they accumulate in living organisms. Based on these adverse characteristics they pose a threat to the environment and human health. They are prohibited in all Nordic Swan Ecolabel products.The requirement is updated compared to criteria generation 3.

Per- and polyfluoroalkyl substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS) are a group of substances with undesirable properties. The substances are persistent and are readily absorbed by the body. PFASs are defined as fluorinated substances containing at least one fully fluorinated methyl or methylene carbon atom (without any H / Cl / Br / I atom attached to it), i.e., with a few listed exceptions, all chemicals with at least one perfluorinated methyl group (–CF3) or a perfluorinated the methylene group (–CF2–) is a PFAS as described in the OECD recommendations[5]. This is a new requirement in generation 4 of the criteria.

Phthalates (i.e., esters of phthalic acid CAS No. 88-99-3)

Several phthalates are identified as endocrine disruptors and some of them are classified as reprotoxic. For these reasons several phthalates are included in the Candidate list. Based on their hazardous properties, phthalates pose a threat to the environment and human health and there is a ban on this group of substances. The requirement is unchanged compared to criteria generation 3.

Potential or identified endocrine disruptors

Endocrine disruptors (EDs) are chemicals that alter the functioning of the endocrine (hormone) system and consequently cause adverse health effects. The 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. By excluding both identified and prioritised potential EDs which are under evaluation, Nordic Ecolabelling ensures a restrictive policy on EDs.

The ED lists I-III on https://edlists.org/ 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.

Quaternary ammonium compounds, which are not aerobically or anaerobically biodegradable such as DTDMAC (CAS No. 61789-80-8), DSDMAC (CAS No. 107-64-2), DHTDMAC (CAS No. 61789-72-8) and DADMAC (CAS No. 7398-69-8).

Quaternary ammonium compounds (QACs) are usually surface-active agents where some of them precipitate or denature proteins and destroy micro-organisms. QACs are toxic to a lot of aquatic organisms including fish, daphnids, algae, rotifer and microorganisms employed in wastewater treatment systems. The requirement is unchanged compared to criteria generation 3.

[5] Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances: Recommendations and practical Guidance, OECD 2021.

Siloxanes D4, D5, D6 and HMDS

Siloxanes are a group of substances with molecular weights from a few hundreds to several hundred thousand. Many of them are substances with PBT and/or vPvB properties and gives rise to specific concern based on their potential to accumulate in the environment. Therefore, siloxanes with known problematic properties are excluded, more specifically D4, D5, D6 and HMDS. Other siloxanes or silicones are not included on the list of substances prohibited in the product under this requirement; however, they are restricted under requirement O11 (Biodegradability) and requirement O12 (Critical dilution volume (CDV)). This is a new requirement in generation 4 of the criteria.

Substances on the REACH Candidate list of SVHC substances
https://www.echa.europa.eu/candidate-list-table

The Candidate List identifies substances of very high concern which fulfil the criteria in article 57 of the REACH Regulation (EC 1907/2006). The list includes carcinogenic; mutagenic; and reprotoxic substances (CMR, categories 1A and 1B in accordance with the CLP Regulation); and PBT (persistent, bioaccumulative and toxic) and vPvB (very persistent and very bioaccumulative) substances (as defined in REACH Annex XIII). In addition, two more substance groups are included if they are of equivalent level of concern (ELoC) as the ones previously mentioned. These are endocrine disruptors and substances which are environmentally hazardous without fulfilling the requirements for PBT or vPvB. Based on these adverse characteristics, Nordic Ecolabelling prohibits substances on the Candidate List. This means that we act ahead of the legislation and ban the substances before they are subject to authorisation and restriction in accordance with REACH. The requirement is unchanged compared to criteria generation 3.

Background to requirement O10 Microplastics

Microplastics[6] 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.

Nordic Ecolabelling is concerned about consequences when microplastics are released into the environment. Thus, we do not apply the derogations in paragraph 4 and 5 of Annex XVII to the REACH Regulation (EC) No 1907/2006 when excluding microplastics.

The requirement is new for this generation of the criteria.

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

Background to requirement O11 Nanomaterials

Nanomaterials[7] are a diverse group of materials under the size of 100 nm. Due to their small size and large surface area nanoparticles are often more reactive and may have other properties compared to larger particles of the same material. Further, different sizes, shapes, surface modifications and coatings can also change their physical and chemical properties. Nanoparticles can cross biological membranes and thus be taken up by cells and organs. One of the main concerns are linked to free nanoparticles, as some of these – when inhaled – can reach deep into the lungs, where the uptake into the blood is more likely.

There is concern among public authorities, scientists, environmental organisations, and others about the insufficient knowledge regarding the potential detrimental effects on health and the environment[8],[9],[10]. Nordic Ecolabelling takes these concerns seriously and applies the precautionary principle to exclude potentially hazardous nanomaterials from products.

The requirement is new for this generation of the criteria.

3.2 Biodegradability and aquatic toxicity

Background to requirement O12 Long-term environmental effects

A Nordic Swan Ecolabelled product must not be classified as environmentally hazardous, see requirement O2 (Classification of the product). To further minimise potential problems for the aquatic environment, a limit has been set for the highest permitted content of environmentally hazardous substances in a product.

The requirement has been changed compared to generation 3 of the criteria, removing the exemption for surfactants classified as H411 and H412. However, the intention has been to maintain the same level of the requirement. The requirement is also changed regarding the unit (from % in product to grams/litre in-use solution) and is set per product type. In addition, the multiplying factor M, for H410 as stated in CLP, is included in the calculation.

Background to requirement O13 Biodegradability

The persistence of substances in nature is an important environmental parameter. The extent to which substances degrade in aquatic environments indicates how long they may impact the ecosystem. Degradation in water depends on the presence of oxygen in the receiving environment, which is why Nordic Ecolabelling distinguishes between aerobic (with oxygen) and anaerobic (without oxygen) degradability.

---

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

[8] 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

[9] Parliamentary Assembly of the Council of Europe (2013) Nanotechnology: balancing benefits and risks to public health and the environment. http://assembly.coe.int/CommitteeDocs/2013/Asocdocinf03_2013.pdf

[10] 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

The proportion of non-aerobically or anaerobically degradable substances varies across different products. Industrial cleaning and degreasing agents may contain limited amounts of organic compounds that are neither aerobically nor anaerobically degradable. By restricting the content of such substances in chemicals, Nordic Ecolabelling ensures that no more substances are released into the environment than necessary.

Since cleaners for solar modules are used exclusively outdoors, it cannot be guaranteed that some release into the environment will not occur during application. Therefore, the use of organic substances that are aerobically non-biodegradable (aNBO) is not permitted.

The requirement has been changed compared with generation 3 of the criteria in terms of: The use of organic substances that are aerobically non-biodegradable (aNBO) is not permitted in cleaners for solar modules.

Background to requirement O14 Critical dilution volume (CDV)

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

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

The requirement has been changed compared with generation 3 of the criteria in terms of: The limit values have been tightened up and the exemption for hydrochloric acid is removed.

3.3 Performance

Background to requirement O15 Performance

Performance testing is primarily a quality requirement to ensure that a Nordic Swan Ecolabelled product delivers effective cleaning results for its intended areas of use at the specified dosage. A product that performs well reduces the risk of overdosing.

Input from industry representatives and consultation feedback for criteria generation 3 indicated that there are no widely recognized standardized tests for these products' performance. Therefore, Nordic Ecolabelling developed a structured framework for a laboratory test as an alternative to the user report. This laboratory test has been refined and adapted for industrial cleaning and degreasing agents through dialogue with manufacturers, with the aim of enhancing test quality. The laboratory test may be conducted as specified in Appendix 5 or through another well-documented laboratory test, provided it receives Nordic Ecolabelling's approval prior to testing.

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

3.4 Packaging and user information

Background to requirement O16 User information

Incorrect use and overdosing of products result in an unnecessary and increased environmental impact. To mitigate this, Nordic Ecolabelling requires that the product label or accompanying product sheet includes clear information on the intended use and correct dosage.

To ensure safe use of the product, there must be a description of how the user can avoid coming into contact with the product.

To make sure proper disposal of products considered as environmentally hazardous waste after use, for example brush cleaner, there must be a statement that the product should be disposed of accordingly.

The paints from graffiti removal often contain high levels of heavy metals. Therefore, remediated paint should be strictly handled to ensure it is not discharged into recipients or the municipal sewage system. It can, for example, be done by carrying out the graffiti removal in a dedicated remediation hall where the process water is treated, or by collecting the liquid in absorbent cloths/mats or in a container and then handling it as hazardous waste.

The requirement has changed compared to generation 3 of the criteria regarding the information on how to handle remediated paint from graffiti removal.

Background to requirement O17 Packaging

The Nordic recycling manuals for plastic packaging[11] are the base for the requirement stating that plastic bottles/containers and closures must be made from PE, PP or PET. These are the best plastics from a recycling perspective. Biodegradable plastics are not suitable in today’s recycling systems and can cause problems in the material recovery process.

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

PET containers must have labels made of PE or PP. Labels for sizes > 500 ml must not cover more than 70% of the container, and maximum 50% sizes ≤ 500 ml. The calculation of the percentage shall be based on the two-dimensional profile of the container i.e., the area of the top and bottom of the packaging and the sides of a box/container/bottle/can shall not be included in the calculation. If the label on the front of pack and back of pack are of different size, the maximum percentage of (50% or 70%) 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.

The permitted sizes of labels of material other than the container come from ReCyclass' recommendations. These are the sizes they have tested and can vouch for in relation to NIR sorting. Swedish authorities' national Eco design guidelines have chosen to say 60% for all

[11] http://norden.diva-portal.org/smash/get/diva2:1364632/FULLTEXT01.pdf (Accessed 2020-08-12)

sizes. We have not been able to find a basis for that decision and have therefore chosen to go with what has been tested.

The exemption for membranes, oblates and seals in closures, is set because of regulations on dangerouse goods (ADR) which will be relevant for industrial cleaners and degreasers.

The requirement covers packaging with a volume of up to 20 liters. Larger packaging is often delivered for reuse.

The requirement is new for this generation of the criteria.

3.5 Licence maintenance

Background to requirement O18 Customer complaints

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.

Background to requirement O19 Traceability

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.

4 Environmental impact of industrial cleaning and degreasing agents

The relevant environmental impacts found in the life cycle of industrial cleaning and degreasing agents are set out in a MECO scheme, see section 6.2. A MECO describes the key areas that have impact on the environment and health throughout the life cycle of the product – including consumption of materials/resources (M), energy (E), chemicals (C) and other impact areas (O).

Nordic Ecolabelling sets requirements concerning the topics and processes in the life cycle that have a high environmental impact – also called hotspots. Based on the MECO analysis, an RPS tool is used to identify where ecolabelling can have the greatest effect. R represents the environmental relevance, P is the potential to reduce the environmental impact and S is the steerability on how compliance with a requirement can be documented and followed up. The criteria contain requirements in those areas in the life cycle that have been found to have high RPS, since there is potential to achieve positive environmental gains.

Degradability and toxicity to aquatic organisms, exposure of chemicals harmful to health, emission of VOC, eutrophication from phosphorous compounds, user information, dosing and performance and packaging stand out as key parameters in the MECO analysis. See section 6.1 for a RPS scheme on these parameters.

4.1 RPS scheme

Life cycle stages	Area and assessment of R, P, S (high, medium or low)	Comments
Raw material		
	It is not identified any environmental hotspots during the raw material phase.	
Production		
	It is not identified any environmental hotspots during the production phase.	
Use		
	Professional users' exposure to allergens and other hazardous chemicals R: High P: High S: High RPS: High	R is high due to professional users being exposed to allergens and other hazardous chemicals. P is high as there is a potential to prohibit or limit allergens and other hazardous chemicals, like aromatic solvents and endocrine disruptors. There is also a potential to ensure safe use of the product. S is high as requirements to prohibit or limit allergens and other hazardous chemicals can be set. In addition, Nordic Ecolabelling can require that the product label or accompanying product sheet include a description of how the user can avoid coming into contact with the product. For certain products, the packaging design may also be required to demonstrate that users do not come into contact with the product.

	Professional satisfaction influenced by product quality, effectivity, and shelf life R: High P: High S: High RPS: High	R is high because a poorly performing product may lead to overdosing, resulting in unnecessary and increased environmental impact. P is high as there is a potential to ensure that the product performs well. S is high as Nordic Ecolabelling can set up performance requirement.
	Reduced wastage based on dosing instructions and design R: High P: High S: Medium RPS: High	R is high because overdosing of products result in an unnecessary increased environmental impact. P is high as there is a potential to ensure correct use of the product and to limit overdosing. S is medium as Nordic Ecolabelling can require that the product label or accompanying product sheet includes clear instructions for use and recommended dosage for products that require dilution before use. However, it is the user who decides whether the information is followed.
	The graffiti paint that the cleaning agents transfer into the water recipient R: High P: High S: Medium RPS: High	R is high because the paints from graffiti removal often contain high levels of heavy metals. Therefore, when removing graffiti, a great environmental impact comes from the graffiti paint that accompanies the cleaning agent when it is removed. P is high as the remediated paint could be properly handled and not be discharged into recipients or the municipal sewage system. S is medium as Nordic Ecolabelling can require that the product label or accompanying product sheet includes information on how to handle remediated paint from graffiti removal. However, it is the user who decides whether the information is followed.
	Emission of VOC R: High P: High S: High RPS: High	R is high as VOCs are harmful to health and contribute to ground-level ozone formation and are often slow to degrade in ecosystems, leading to long-term environmental impacts. P is high as there is a potential to prohibit or limit VOCs. In addition, ventilation during use of the product can reduce the exposure for the user. S is high as requirements to prohibit or limit VOCs can be set. Also, Nordic Ecolabelling can require that the product label or accompanying product sheet includes health and safety instructions.
End of life		
	Loss of the material value if packaging is incinerated (higher impact) vs. recycled (lower impact) R: Medium P: Medium S: High RPS: Medium	R is medium due to consumption of energy and fossil resources. P is medium as the packaging sizes generally are large (> 20 litres) and they are commonly reused. However, there are smaller packaging where there is potential to promote design for recycling.

		S is high as requirements concerning the packaging's recyclability can be set for smaller packaging.
	Wastewater emissions of chemicals toxic to aquatic organisms R: High P: High S: High RPS: High	R is high as the product end up in a water treatment plant and then the water recipient. The product therefore risks to harm both aquatic organism and the ecosystem, depending on the inherent properties of the ingredients. P is high as there is a potential to reduce the content of environmentally hazardous ingredients such as substances toxic to aquatic organism, non-degradable substances, microplastics, endocrine disruptors etc in the products. S is high as requirements to prohibit or limit problematic substances can be set.
	Emissions of phosphorous compounds that cause eutrophication R: High P: High S: High RPS: High	R is high because phosphorus is a driver of eutrophication. P is high as there is potential to prohibit or limit the content of phosphorus in the products. S is high as requirements to prohibit or limit phosphorous in the products can be set.

4.2 MECO scheme

	Raw material	Production	Use	End of life	Transport
Material	Extraction of oil, gas, metals, and minerals for non-renewable raw materials Agricultural production for renewable raw materials Forestry for paper-based packaging Water consumption in raw material production		Water consumption in use	**Loss of the material value if packaging is incinerated (higher impact) vs. recycled (lower impact)**	
Energy	Energy consumption to extract/cultivate and process raw materials for product and packaging (15-30% GWP in LCA, with higher water content reducing raw chemical contribution but increasing packaging contribution)	Energy consumption to produce product and packaging (ca 5% GWP in LCA for liquids; ca 10% for powder or solid products due to energy for drying)	Energy for heating water for product use (50-75% GWP in LCA, if applicable)	Energy from wastewater treatment and solid waste handling (5-20% GWP in LCA)	Energy use of transport vehicles (ca 5% in LCA)
Chemicals	Agricultural chemicals including pesticides and fertilizers Exposure to hazardous chemicals in the work environment or nearby communities	Exposure to hazardous chemicals in the work environment or nearby communities	**Professional users' exposure to allergens and other hazardous chemicals** **The graffiti paint that the cleaning agents transfer into the water recipient**	**Wastewater emissions of chemicals toxic to aquatic organisms** **Emissions of phosphorous compounds that cause eutrophication**	Air pollution from transport vehicles
Other	Biodiversity and ecosystem impacts from resource extraction, forestry, and agriculture Conflicts arising due to land right disputes and impacts on		**Professional satisfaction influenced by product quality, effectivity, and shelf life**	Biodiversity and health impacts from hazardous chemicals from sewage sludge leaching to land and water	Particulate matter from transport vehicles

	local and indigenous communities Higher food prices due to raw material production competing with food production		**Reduced wastage based on dosing instructions and design** **Emission of VOC**	Emissions of microplastics or nanomaterial (due to product's formula or using the product)	

Sources for MECO

Boyano, A. and R. Kaps, G. Medyna, O. Wolf (2016). Revision of six EU Ecolabel Criteria for detergents and cleaning products. Main environmental hotspots, pp. 8-14. https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/contentype/product_group_documents/1581681262/Technical%20background%20report.pdf

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2015). 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

Golsteijn, L. and R. Menkveld, H. King, C. Schneider, D. Schowanek, S. Nissen (2015). A compilation of life cycle studies for six household detergent product categories in Europe, Environmental Sciences Europe, 2015, 27:23. http://enveurope.springeropen.com/articles/10.1186/s12302-015-0055-4

Koehler, A. (2009). Comparing the Environmental Footprints of Home-Care and Personal-Hygiene Products: The Relevance of Different Life-Cycle Phases, 2009, Environ. Sci. Technol, 43, 8643–8651. https://assets.website-files.com/60785920d3e83f34edf78d07/612d9f94be86e62781325e80_Envtl%20Sci%20Tech%202009.pdf

Suikkanen, J. and A. Nissinen, M. Wesnaes (2019). Nordic Swan Ecolabel and Product Environmental Footprint: Focus on Product Environmental Information. https://norden.diva-portal.org/smash/get/diva2:1354808/FULLTEXT01.pdf