About Nordic Swan Ecolabelled

Industrial cleaning and degreasing agents



Version 3.2

Background to ecolabelling
09 March 2021

Nordic Ecolabelling

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Appendix 1 MECO matrix for industrial cleaning and degreasing agents

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

Addresses

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

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1 Summary

Industrial cleaning and degreasing agents should be able to remove oil residues, wax, grease, dirt, dust and any rust from surfaces, machine parts, tools and pipe systems made from substances such as steel, aluminium, concrete and plastic.

Areas of use may include cleaning and degreasing of floors and walls in production premises, machinery and machine parts, production equipment and metal parts in industry, tanks/cargo holds on ships, ship decks and decks on oil platforms, pipe systems (CIP cleaning) and façades, removing cooling and cutting oil and cleaning water cooling systems.

Nordic Swan Ecolabelled industrial cleaning and degreasing agents:

- Have the ability to remove oil, grease and dirt while also being gentle on the environment.
- Are biodegradable, do not bioaccumulate and limit emissions of toxic substances into the aquatic environment.
- Are performance tested and are as good as comparable products.

This background document contains a description of industrial cleaning and degreasing agents and their environmental impact seen from a life cycle perspective. In addition, the document contains a description of the products and the market, as well as the background to the requirements set out in the criteria document.

Nordic Swan Ecolabelled industrial cleaning and degreasing agents have previously been limited to products for indoor use, but the product group has now been expanded to also include products for outdoor use. This means that industrial cleaning and degreasing agents used offshore, both in the oil industry and in shipping, and for façade cleaning can now be Nordic Swan Ecolabelled.

Nordic Ecolabelling applies the precautionary principle and therefore sets strict requirements concerning chemicals that are harmful to health and the environment, and encourages technology that replaces such chemicals.

Industrial cleaning and degreasing agents must, however, be effective – an important factor for industry in minimising downtime and thus reducing costs – and it is also important for the environment that the products are of sufficient quality with regard to the areas of use. Ecolabelling of the products therefore also needs to include requirements concerning performance/quality.

Nordic Swan Ecolabelled industrial cleaning and degreasing agents have not really caught on to any great extent, a fact that may be due to a lack of clarity on what types of products can be ecolabelled and in which industries the products may be used. There is therefore a focus on the boundaries set by the criteria, i.e. which products can be Nordic Swan Ecolabelled in line with the criteria. An adaptation of the criteria to the industries we want to reach and an expansion of the product group are a good starting point for more industrial cleaning and degreasing agents to be Nordic Swan Ecolabelled and for more industries to request the products. In addition, the requirements concerning content of environmentally harmful substances and phosphorus have been tightened.

2 Basic facts about the criteria

2.1 Products that can be labelled

The main function of industrial cleaning and degreasing agents is to remove oil residues, wax, grease, dust and other dirt from surfaces, machine parts, tools and pipe systems made from substances such as steel, aluminium, concrete and plastic. Nordic Swan Ecolabelled industrial cleaning and degreasing agents may only be marketed to professional users in industry.

The areas of use are many and varied for the products in this product group. They include:

- degreasing floors and walls in production facilities
- cleaning and degreasing metal parts in industry, machinery and machine parts, and production equipment
- façade cleaning in the sense of graffiti removal and external cleaning for maintenance purposes
- cleaning and degreasing floors, decks and oily/greasy equipment offshore (on oil platforms)
- cleaning decks/tanks/cargo holds on ships
- cleaning water cooling systems and water treatment plants (not water treatment chemicals)
- cleaning pipe systems (CIP – cleaning in place)
- cleaning agents for cleaning of liquid damaged electronics

What differentiates industrial cleaning and degreasing agents from other cleaning products is the type of soiling they are supposed to clean, combined with the concentration of the soiling (grease/oil/stains/ soot/rust/inorganic salts), which is usually higher for the areas in which industrial cleaning and degreasing agents are used.

The product group was previously limited to products for indoor use, but this version also includes products for outdoor use. This means that industrial cleaning and degreasing agents for use offshore, both in the oil industry and in shipping, and for façade cleaning can now be Nordic Swan Ecolabelled. Several manufacturers have expressed an interest in Nordic Swan Ecolabelling their products for outdoor use.

Nordic Swan Ecolabelled industrial cleaning and degreasing agents may only be marketed to professional users in industry. Products for car and boat cleaning and care, cleaning agents for consumers and other cleaning products are covered by separate criteria documents.

Chapter 3 provides a detailed description of the types of cleaning agents and their areas of use.

What can carry the Nordic Swan Ecolabel?

The main function of industrial cleaning and degreasing agents is to remove soiling such as oil residues, wax, grease, dust and other dirt from surfaces, machine parts, tools and pipe systems made from substances such as steel, aluminium, concrete and plastic.

The areas of use are many and varied for the products in this product group. They include:

- *degreasing floors and walls in production facilities*
- *cleaning and degreasing metal parts in industry, machinery and machine parts, and production equipment*
- *façade cleaning in the sense of graffiti removal and cleaning for maintenance purposes*
- *cleaning and degreasing floors, decks and oily/greasy equipment offshore (on ships and oil platforms)*
- *cleaning decks, tanks and cargo holds on ships*
- *cleaning water cooling systems and water treatment plants (not water treatment chemicals)*
- *cleaning pipe systems (CIP – cleaning in place)*
- *cleaning agents for cleaning of liquid damaged electronics*

The products may only be marketed to professional users in industry.

The criteria do not cover car and boat care products, products specifically for use in the food industry, and universal and sanitary cleaning agents, since there are separate criteria for these product types.

Products containing microorganisms, water treatment chemicals and products for the pharmaceutical industry also cannot be Nordic Swan Ecolabelled.

Disinfectant products cannot carry the Nordic Swan Ecolabel due to restrictions arising from the Biocidal Products Directive.

Nordic Ecolabelling has criteria for other types of cleaning agents. For products that cannot be Nordic Swan Ecolabelled under this document, see the other Nordic Ecolabelling documents. Contact us for more information, addresses can be found on page 2.

2.2 Justification for Nordic Swan Ecolabelling

The environmental impact from industrial cleaning and degreasing agents derives primarily from emissions to air, wastewater and water recipients during the use of the product. Large quantities of cleaning agent are used, and many of the chemicals traditionally employed have an environmental impact, such as aromatic hydrocarbons, chlorine compounds and complexing agents.

Nordic Swan Ecolabelled industrial cleaning and degreasing agents:

- Have the ability to remove oil, grease and dirt while also being gentle on the environment.
- Are biodegradable, do not bioaccumulate and limit emissions of toxic substances into the aquatic environment.
- Are performance tested and are as good as comparable products.

2.3 Version and validity of the criteria

The first version of the criteria for industrial cleaning and degreasing agents was adopted by the Nordic Ecolabelling Board (NMN) in June 1999. The criteria have since been revised twice.

Version 1 (approved June 1999) covers the ecolabelling of industrial cleaning and degreasing agents for manual and automated cleaning in the mechanical, electronic and graphic manufacturing industries, plus the surface treatment and paint industries.

The product group parameters excluded products such as industrial cleaning and degreasing agents for the food industry and pharmaceutical industry, since these have special requirements concerning antibacterial effect.

Version 2 (approved October 2005). Material changes between version 1 and version 2 included a tightened requirement concerning the environmental and health-related properties of constituent substances, through tighter requirements relating to environmentally harmful substances, complexing agents and degradability (aerobic and anaerobic).

Version 3 (approved June 2015). The product group has been expanded to also include products for outdoor use.

2.4 The Nordic Market

The industry for industrial cleaning and degreasing agents comprises large and small manufacturers and suppliers. Industrial cleaning and degreasing agents usually make up a minor part of a larger range. The players often produce and supply both consumer and professional products within several product types, rather than just industrial cleaning and degreasing agents.

The products are sold to a number of industries, for both indoor and outdoor use. The customers are involved in areas such as manufacturing, energy generation, offshore, onshore, shipping and the food industry.

2.5 Nordic Swan Ecolabel licences

In 2014, the Nordic market had 10 licences covering 77 products in the field of industrial cleaning and degreasing agents under version 2[1], see Table 1 below.

Table 1 – Industrial cleaning and degreasing agents: no. of Nordic licences and products

Country	No. of licences	No. of products
Denmark	2	28
Finland	4	15
Iceland	1	22
Norway	2	10
Sweden	1	2

2.6 Other labels

EU Ecolabel[2]
The EU Ecolabel is the official ecolabelling scheme established by the European Commission to encourage the marketing of products and services that meet the environmental standards set by the EU Ecolabel. The EU Ecolabel is a Type 1 labelling scheme like the Nordic Swan Ecolabel. The EU Ecolabel has criteria for a range of products and services, but no criteria for industrial cleaning and degreasing agents.

Bra Miljöval
The Swedish Society for Nature Conservation has Bra Miljöval (Good Environmental Choice) criteria in a variety of product areas. The scheme has no specific requirements

[1] OMNIS 22 May 2014
[2] www.ecolabel.eu

for industrial cleaning and degreasing agents, but it does have criteria for chemical products[3] that include everything from shampoo to cleaning agents and car care products. There are degreasing agents and graffiti removers that are labelled as Bra Miljöval.

Environmental Choice New Zealand
Environmental Choice is New Zealand's official ecolabel. It has criteria for "Commercial and Institutional Cleaners" that cover products for professional cleaning and products for routine cleaning of offices, institutions, warehouses and industrial plants[4].

The criteria cover products for cleaning organic and inorganic dirt from plastic, glass, ceramic, metal, porcelain, rubber, leather, wood, stone and other hard surfaces.

Green Seal USA
Green Seal is a non-profit organisation that develops environmental standards and certifies a number of products and services. Green Seal has criteria for cleaning agents and degreasing agents that clean dirt as part of production and maintenance programmes[5]. The criteria set requirements in areas including toxicity, harm to health and content of VOC. There are also requirements relating to the degradability and aquatic toxicity.

Several products are labelled with the Green Seal according to the standard "Cleaning and degreasing agents GS 34, edition 2.1", including degreasers for use in the graphic, maritime and construction industries.

Green Public Procurement (GPP)
Green Public Procurement (GPP) is a process under which public bodies seek to procure goods, services and work with a reduced environmental impact through their life cycle compared with goods, services and work with the same primary function as what would otherwise be bought in.

There are recommendations concerning both cleaning agents and cleaning performance[6], divided into product categories that include consumer products. There is no GPP for industrial cleaning and degreasing agents.

3 Industrial cleaning and degreasing agents

Industrial cleaning and degreasing agents must have properties that mean they can remove dirt and clean effectively, to reduce both downtime and the time it takes to conduct mechanical maintenance work. Nordic Swan Ecolabelled industrial cleaning and degreasing agents have to be effective and offer good performance, in addition to being gentle on the environment.

The criteria for industrial cleaning and degreasing agents previously only applied to products for indoor use. In the revised criteria, the product group parameters are aimed at industrial cleaning and degreasing agents for indoor and outdoor use in industrial production facilities and production equipment. This can, however, be interpreted very

[3] Bra Miljöval kriterier Kemiska Produkter, version 2006:4
[4] The New Zealand Ecolabelling Trust, Licence Criteria for Commercial and Institutional Cleaners, EC-37-10
[5] GREEN SEAL STANDARD FOR CLEANING AND DEGREASING AGENTS GS-34, Edition 2.1, July 12, 2013.
[6] http://ec.europa.eu/environment/gpp/pdf/toolkit/cleaning_GPP_product_sheet_da.pdf

broadly, and so a wide variety of products have been Nordic Swan Ecolabelled in line with the criteria. The scope ranges from circulation cleaning (CIP – cleaning in place) for pipes, cleaning agents (alkaline micro-emulsions), component cleaning agents and deep cleaning agents to cleaning oily surfaces, engines, machines, workshop floors, cargo holds and tanks in cargo ships/tankers and tanker trucks. A licence has also been issued for products to clean away dirt and grease from surfaces before they are painted. Although the areas of use are varied, the main function of industrial cleaning and degreasing agents is to remove oil residues, wax, grease, dust and other dirt from surfaces, machine parts, tools and pipe systems made from substances such as steel, aluminium, concrete and plastic.

To clarify the customer segment for this product group, in this version of the criteria we have stressed that the product group only relates to professional products, and there is a requirement that the products can only be marketed to professional users in industry.

An expansion of the product group to include products for outdoor use makes it necessary to examine additional areas of use and to consider how far Nordic Ecolabelling wishes the criteria to reach.

Since the areas of use are so varied, it is only natural to describe in more depth the product types, cleaning methods and areas of use.

3.1 Product types

Within engineering, the paper industry and other industries, it is important to regularly clean facilities, machinery and equipment to maintain operations and avoid too many production shutdowns. The products have to be able to remove soiling (such as oil, metal deposits and lubricants), and clean and maintain the production facilities and production equipment, or prepare metal components for surface treatment.

The cleaning methods and the products are adapted to the materials being cleaned and the soiling being removed. The product types and cleaning methods are described in more detail below.

There are four main types of product when it comes to industrial cleaning: acid-based, alkali-based, micro-emulsions and solvent-based.[7]

Acid-based products
Strong, acid-based products can be used to remove hard deposits and limescale from water systems and water circulation equipment. The products may contain 70-80% hydrochloric acid (HCl). The product may also be used for cleaning floors, walls, grouting, process equipment, rims and so on, plus other acid resistant surfaces. Other properties may include removing oxidation, rust and algae.

Alkali-based products
Products with a high alkali content are able to remove grease and dirt, oil, cutting fluids and other industrial deposits from parts or production equipment, as well as concrete floors/structures, drilling rigs, engine blocks, rail equipment, plant and paper machinery.

[7] Contact with manufacturers

The products contain surfactants and may contain small quantities of caustic soda (NaOH), alcohols and glycol ethers, which can damage health if the products are not used correctly.

Solvent/petroleum-based degreasers
Products that are solvent/petroleum-based are able to remove oil, grease, tar and other soiling while not corroding metal. The products may contain large quantities of naphtha (petroleum) and other substances that are classified as harmful to both health and the environment, such as aromatic hydrocarbons. They are used undiluted.

Micro-emulsions
Micro-emulsions comprise oil (e.g. hydrocarbons), water and surfactants and have a droplet size of less than 100 nm. Micro-emulsions are a stable single phase system, i.e. they do not separate spontaneously during storage.

3.2 Cleaning methods, cleaning systems and areas of use

There are specific products for each of the cleaning methods, whether they involve manual application, a cleaning machine or a flushing system. Nordic Ecolabelling only has requirements for the cleaning products, but sees the correct combination of cleaning method and product as important in achieving satisfactory cleaning results. It may be of interest to consider requirements for cleaning methods in future criteria.

General method of application

A common method for removing oil and dirt from surfaces (walls and floors) or machine parts made from steel and metal alloys is to spray the surfaces and then rinse with water after a certain period. When cleaning surfaces, small spray cans and aerosol cans with adapted nozzles/spray guns or large trucks or machines with flushing nozzles/guns may be employed, depending on what is being cleaned.

When cleaning components, it is common to use solvent-based products that evaporate. Some components cannot tolerate water and it is important that residues of the cleaning agent evaporate once the dirt has been removed.

Cleaning machines

When cleaning production equipment and metal parts/components, custom industrial cleaning machines may be used. Chamber washers are used to wash metal parts for both cleaning and maintenance. Ultrasound cleaners are used to remove dried-on oil, grease, wax, limescale, oxidation and algae. Combi-washers use steam and pressure washing to remove oil, grease, limescale and metal dust and to clean floors in industrial workshops.

The washers/cleaners have their own dosing devices and the cleaning products that require dilution are usually diluted with cold water.

Ordinary cleaners/combi-machines are used to clean/degrease floors in production facilities.

Coating system

On tankers/cargo ships it is necessary to clean the tanks/cargo holds between each time they are filled with new products. There tends to be a difference between tanks, which

are used for liquid cargo, and cargo holds, which are used for dry cargoes such as coal, maize and salt.

It can be challenging to make these cargo holds clean enough to avoid contamination[8] of foodstuffs, for example. Coal is very difficult to clean due to small coal particles fastening in small dips in the surfaces. Water cannons are the most widely used method. Mechanical cleaning with brushes would be preferable, but it is difficult to access the tanks/cargo holds, which can be of a considerable size. To clean the tanks of problematic dirt like coal dust, it is common to use a 25-30% concentration of a strong alkaline cleaning agent, but even then the surfaces may not always be completely clean.

One manufacturer has developed a temporary coating (film) that forms a barrier between the surface and the cargo[9]. The film forms a very thin and smooth surface that is insoluble in water, but readily soluble in an alkaline cleaning agent. The film is applied after cleaning and before the dry cargo is loaded into the cargo holds. After the cargo has been unloaded from the cargo holds, a weak alkaline solution (5%) is applied and then rinsed off with clean water. The surfaces end up being completely clean, cleaning takes less time, less of the cargo attaches to the walls, and the amount of water and chemicals used is significantly reduced.

CIP in industry

Circulation cleaning (cleaning in place – CIP) is a method for cleaning pipe systems, heating and cooling systems, process equipment, filters and so on, without the need for disassembly.

CIP is used in particular in industries that require good hygiene, such as the food industry, the pharmaceutical industry and the cosmetics industry, but is also used in other types of industry. A typical CIP cycle involves numerous steps, including flushing clean water through the pipe system, under pressure or not, washing with CIP cleaning agent, rinsing with water and finally drying. The advantage of CIP is that the cleaning is often faster, it requires a smaller workforce and the users are less exposed to the products. Suppliers often offer a complete cleaning package, including CIP machine, training and chemicals.

Outdoor/indoor industrial cleaning and degreasing agents

The criteria for industrial cleaning and degreasing agents were previously restricted to products for indoor use. In this version, Nordic Ecolabelling has expanded the criteria such that products for outdoor use may also be Nordic Swan Ecolabelled.

There is essentially little difference between industrial cleaning and degreasing agents intended for indoor and outdoor use. There is a greater difference between products with different functions, such as degreasing machine parts and cleaning floors. In other words, a crucial factor for industrial cleaning and degreasing agents is the intended function of the product and the type of soiling it is supposed to clean (grease/oil/stains/ soot/rust/inorganic salts).

For products that are used outdoors, account must be taken of the fact that the products and the dirt to be removed may end up directly in the water recipients and not in the municipal sewerage system. This applies, for example, to products for façade cleaning

[8] Fred Inge Tornes, Technical Manager, Wilhelmsen Chemicals AS
[9] Wilhelmsen Chemicals AS

and offshore use. Offshore installations are required to collect the wash water and dirt for processing on land, but there remains a possibility of discharge directly into the water recipient.

Products for offshore and drilling rigs

Offshore regulations

The 1972 Oslo Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft and the 1974 Paris Convention for the Prevention of Marine Pollution from Land-Based Sources were replaced in 1992 by the Convention for the Protection of the Marine Environment of the North-East Atlantic, known as the OSPAR Convention. The convention governs land-based emissions, dumping and incineration, offshore activities and monitoring of the marine environment. In 1998, the convention gained a new Annex V on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area.

HOCNF (Harmonised Offshore Chemical Notification Format) applies for all chemicals used in connection with offshore exploration and production activities in areas covered by the OSPAR Convention. The chemicals are split into the categories black, red, yellow and green, where green is the strictest category. Products categorised as green are considered under HOCNF not to have any significant environmental impact and the constituent substances are included on OPSAR's PLONOR list[10] (Pose Little or No Risk to the Environment). Some of the requirements concerning substances on the PLONOR list include:

- No CMR (carcinogenic, mutagenic, reprotoxic) properties.
- No classification in line with Directive 67/548/EEC, Annex VI that entails the risk phrases R50, R50/53, R51/53, R52/53, R52, R53.
- Organic substances must meet the requirement for LC50 or EC50 > 100 mg/L, LogPow <3 or BCF <100 or MW >1,000 and biodegradability according to OECD 306 or other scientifically accepted method (seawater biodegradation tests).

In addition to the individual requirements, the PLONOR list also comprises a range of specific substances that are judged to have little or no impact on the environment. The substances on this list include phosphates, as shown in the table below:

Table 2 Phosphates on the PLONOR list

CAS number	Substance	CAS number	Substance
7758-79-4	Calcium phosphate	7632-05-5	Sodium phosphate
16068-46-5	Potassium phosphate	14986-84-6	Sodium tetraphosphate
7758-16-9	Pyrophosphate (sodium acid pyrophosphate; SAPP)		

Nordic Swan Ecolabelled industrial cleaning and degreasing agents for use offshore meet all the requirements placed on products contained in the PLONOR list (green products). This entails a separate requirement for degradability in seawater (OECD 306 Biodegrad-

[10] OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR). OSPAR Agreement 2012-06 (Replacing Agreement 2004-10)
Revised February 2013.

ability in seawater) for products that will be used offshore. Nordic Swan Ecolabelled offshore products must also meet some supplementary requirements over and above PLONOR.

Rig cleaning agents
Rig cleaning agents are used to clean decks, oily and greasy equipment and suchlike on drilling rigs. The cleaning chemicals are surfactants whose purpose is to increase the solubility of oil in water.

Businesses that wish to operate offshore in conjunction with drilling for oil must apply to the authorities for an emissions permit. The emissions permit covers the use and discharge of rig chemicals. Typical consumption of cleaning agents for a production field can be 500 litres per month[11]. The cleaning agent is washed away with the wastewater and either collected in slop tanks for return to land or cleaned with the wastewater before discharge. There is some uncertainty about how much of the cleaning agent is discharged into the sea.

When drilling using an oil-based drilling fluid, the drainage from the deck is closed, so that the rig cleaning agent and wash water are not discharged into the sea. When drilling is conducted using water-based drilling chemicals, the cleaning agent and wash water are discharged into the sea[12].

An examination of different emission permits shows the use of rig chemicals that are both PLONOR listed (green category) and in the yellow category.

Nordic Swan Ecolabelled industrial cleaning and degreasing agents meet all the requirements for PLONOR listed chemicals.

Façade cleaning

Façade cleaning may relate to everything from window cleaning and cleaning façades for maintenance to external washing before painting and graffiti removal.

It is necessary to clean building façades to remove dust, dirt and pollution that may erode the façade. Façade cleaning is often conducted using high-pressure jets without the use of chemicals, but chemicals are necessary for pre-painting preparation and graffiti removal.

Pre-painting preparation
Other cleaning agents have been developed to clean building façades and surfaces in preparation for painting or for the maintenance of surfaces that are vulnerable to algae, mould, exhaust fumes, soot and dirt. These products may contain substances such as MI (2-Methyl-3-isothiazolone) and surfactants with unwanted environmental effects, the use of which Nordic Ecolabelling wishes to limit. Pre-painting washes are also used indoors.

Graffiti remover
Graffiti removers are required to quickly and effectively remove unwanted paint, spray-painting and graffiti from buildings, vehicles, etc.

When removing graffiti from façades, the product is generally sprayed onto the façade undiluted. After a specified time (typically 10-15 minutes), the façade is cleared of the

[11] Lundin Norway AS, Application for permit for activities at PL 338, Edvard Grieg field.
[12] Søknad utslippstillatelse Miljødirektoratet Maersk

dissolved graffiti using a jet washer (for larger surfaces) and warm water. For smaller surfaces a cloth is used before rinsing with water.

Equipment for collecting water and the dissolved graffiti does exist, but this equipment is expensive and has not proved particularly popular in the market. This means that the wastewater, cleaning agents and graffiti end up directly in the environment or in the municipal sewerage system.

The products often contain solvents, but may also be water-based and they can be strongly alkaline. Some products also contain substances that may be reprotoxic[13]. When removing graffiti, the greatest environmental impact comes from the dirt on the façade that accompanies the cleaning agent when it is removed.

Tunnel cleaning

Tunnels have to be washed in order to improve road safety. Surfaces and technical equipment/installations in tunnels are cleaned on a regular basis. In Norway alone, there are more than 800 km of tunnels[14], and this results in major emissions of contaminated wash water and sediment. In some regions of Norway, a whole 78% of the tunnels have no form of water treatment system[15]. In the tunnels that do have water treatment systems, these tend to comprise a sand trap, with the particles emptied as required and the level of contamination determining whether the sludge is sent to landfill (Norwegian Public Roads Administration, 2006).

The tunnels are cleaned regularly by washing walls, surfaces, signs, lighting and other technical elements, which produces emissions of wash water containing the same substances as road run-off, in addition to components from cleaning agents. Road run-off contains heavy metals, (lead, copper, zinc, nickel, chromium) and organic environmental toxins, which derive primarily from the materials that are worn down when the roads are used (tyres and the road surface itself). Road run-off may also contain substances associated with undercarriage treatment (DEHP, di(2-ethylhexyl) phthalates, and other phthalates) and the use of other car care products (NPE, nonylphenol ethoxylates).

Contamination of road run-off from tunnels occurs particularly in combination with tunnel cleaning. Such cleaning activities result in run-off water that is highly contaminated with metals, oil, PAH and cleaning substances (and probably a whole host of other, as yet unidentified, substances). Studies[16] of motorway tunnels show that cleaning agents for tunnel cleaning significantly increase the concentration in the wash water of practically all the studied substances, to a level where pretreatment of the wash water is required before it can be discharged into the water recipient.

A report by the Norwegian Public Roads Administration on the effects of tunnel cleaning agents states that the chemicals used for cleaning tunnels may contain several types of surfactants and complexing agents[17] that may be toxic to aquatic organisms. It also indicates that the soap used for tunnel washing constitutes a large proportion of the contamination in run-off from roads and tunnels, and can have an impact on water recipients and the environment.

[13] Contact with the industry.
[14] Statens vegvesen, Norwat - Nordic Road Water, VD rapport nr. 46 (2011)
[15] Statens vegvesen, Estimering av forurensning i tunnel og tunnelvaskevann, Rapport nr. 99 (2013)
[16] Stotz, G. and Holldorb, C. (2008). Highway tunnel washing and its effect on water quality.
[17] Statens vegvesen, Effekter av tunnelvaskemiddel, Corneliussen, Meland, Hanssen, Rosseland

In addition, tunnel cleaning agents may contain solvents, glycols and alcohols.

Nordic Ecolabelling considers that there is little steerability as regards the major environmental problems associated with tunnel washing. Based on clear feedback during the consultation, Nordic Ecolabelling has decided that products for cleaning tunnels will not be included in this version of the criteria for industrial cleaning and degreasing agents.

Other industrial cleaning

Other areas of use for industrial cleaning and degreasing agents include cleaning water systems and water circulation equipment in cooling towers and water treatment plants. Here, there may well be a need for strong, acid-based products that can remove hard deposits and limescale. The cleaning is part of the maintenance routine that is necessary for optimum functionality.

3.3 Concentrated products

Many industrial cleaning and degreasing agents are concentrated and have to be diluted before use. Some products are super-concentrated, and have to be diluted to an even greater extent before use. The benefit of super-concentrates is that the volumes that have to be transported are reduced, and so the number of deliveries can also be cut. Reduced transport brings down transport costs, and having smaller volumes to store means that customers save on warehousing space. It is desirable to dilute concentrated products as close to the final place of use as possible, and to ensure that the correct dosing equipment is used.

In the shipping industry, concentrated products are used to a large degree due to limited storage capacity on board the ships. It is also common for the same product to be used in very varied areas – for cleaning everything from the machine room to decks and cabins[18]. The product is diluted to different degrees, depending on where the product will be used.

There is a classification challenge in categorising concentrated products compared with products that are not diluted before use. Super-concentrated products can end up with an undesirable classification due in particular to the higher concentration of surfactants[19], which has an impact on the classification. A Nordic Swan Ecolabelled product should, however, never be classified as environmentally harmful. Several manufacturers feel there is no problem with concentrated products as regards Nordic Ecolabelling's classification requirements, but Nordic Ecolabelling is still conscious that there could be a problem due to the reclassification of constituent substances as part of the transition to CLP.

Nordic Ecolabelling has limited experience when it comes to reclassifying whole industrial cleaning and degreasing products due to high concentration, and Nordic Ecolabelling thus reserves the right to make adjustments in the future if necessary. Any adjustment will be based on careful consideration of the market, the product and which classification is involved.

[18] Contact with the industry.
[19] James Dixon, NCH.com

3.4 Microorganisms in cleaning products

A number of cleaning products on the Nordic market contain microorganisms to give the products a cleaning effect. The microorganisms are living organisms whose task is to break down organic matter such as proteins, fats and starches in layers of dirt. Products that contain microorganisms cannot exclusively base themselves on microorganisms, since it takes a certain amount of time for the microorganisms to become active. There is also a need for surfactants to provide a cleaning effect.

Microorganisms fall outside the scope of REACH (since microorganisms are not included in the definition of "substances") and are also not covered by the EU's Detergent Regulation according to a report from 2010[20]. Microorganism-based products on the market which claim to have a biocide-like function should be covered by the Biocidal Products Directive.

In its criteria for cleaning agents, the EU Ecolabel excludes microorganisms on the grounds that:

"It is not known whether the microorganisms represent a risk or not because there is no documentation for performance benefits and safety. Ecolabelled products should be based on components that are characterised by sufficient information, and the addition of a non-transparent microbial component without any verification and documentation is considered unacceptable."

Norway has a specific law for products that contain microorganisms, Regulation No. 93 on declaration and labelling of microbiological products resulting in damage to the environment (FOR 1998-01-22 nr 93). The purpose of the regulation is to prevent microorganisms in microbiological products from causing damage to health, or undesirable environmental effects in the form of ecosystem disruption, pollution, waste and so on. The fact that the Norwegian authorities have seen fit to introduce their own regulation for this type of product shows that there are both health and environmental concerns associated with the use of products containing microorganisms.

Contact with manufacturers of Nordic Swan Ecolabelled industrial cleaning and degreasing agents indicates that the use of microorganisms in industrial cleaning agents is not particularly widespread. Offshore, in particularly on board ships, cleaning agents with microorganisms are the preferred choice for removing grease. Some manufacturers acknowledge the existence of products containing microorganisms, but at the same time they see a limit to the usefulness of the products due to the time the products take to work and the limited temperature range within which the products are effective[21].

In this version, Nordic Ecolabelling wishes to enable industrial cleaning and degreasing agents containing microorganisms to obtain the Nordic Swan Ecolabel. These may be included in Nordic Swan Ecolabelled cleaning agents for professional use in the criteria for cleaning agents. The products must undergo a user test showing a lasting effect ("residual cleaning").

4 About the revision

This background document has been drawn up as the basis for a revision of the criteria for the Nordic Ecolabelling of industrial cleaning and degreasing agents. Work on the

[20] Spök, Klade 2010: Environmental, Health and Legal Aspects of Cleaners Containing Living Microbes as Active Ingredients.
[21] Contact with manufacturers during consultation 2014-2015.

revision began in April 2014 and is expected to be completed in March 2015. An evaluation of version 2 of the criteria has formed the starting point for this revision.

Purpose of the criteria revision

The main purpose of the revision has been to draw up a proposal for revised criteria for the Nordic Ecolabelling of industrial cleaning and degreasing agents that ensures positive environmental gains through ecolabelling, while also providing criteria that are usable and clear for the industries which the criteria aims to reach. The revision has addressed the areas identified during the evaluation of the criteria. The evaluation highlighted that the criteria should be revised with a focus on:

- Product group parameters. An examination of the product group definition to assess whether it needs to be made more specific, whether it should be expanded to include products intended for outdoor use, for example in offshore and shipping, and super-concentrates, and whether more clarity is required concerning which markets the products are to be marketed in.
- Reassessing the requirements concerning the inclusion of products that contain microorganisms industrial cleaning and degreasing agents.
- Updating the criteria in accordance with guidelines on chemical technology.
- Reassessing the requirements concerning complexing agents and NTA.
- Updating the requirement regarding the Challenge Test.
- Considering a ban on environmentally harmful dyes.
- Considering the possibility of introducing CDV requirements.
- Considering the introduction of different requirement levels for certain groups of products, for example for the offshore industry.
- Updating the RPS analysis in the background document.
- Drawing up joint Nordic bulletpoints.

About this criteria revision

The project team comprised Anne Kristine Feltman (Product Coordinator) and Lina Harström (Product Adviser) and Terhi Uusitalo (Product Adviser, Product Coordinator). Karen Dahl Jensen was Product Development Manager for the project. During the revision, the project team maintained ongoing contact with the sector, including manufacturers and licensees.

5 Justification for Nordic Swan Ecolabelling of industrial cleaning agents

5.1 MECO analysis of environmental impacts

In order to assess which requirements should be set for the Nordic Ecolabelling of industrial cleaning and degreasing agents, a simple LCA analysis was conducted in the form of a MECO analysis (Materials, Energy, Chemicals and Other characteristics). The MECO matrix is used to assess the environmental impact of industrial cleaning and degreasing agents in five phases of their life cycle. Table 3 shows which parameters were assessed in the MECO matrix for industrial cleaning and degreasing agents.

Table 3 – MECO matrix

	Raw material phase	Production phase	Use phase	Waste phase	Transport phase
Material	Materials for product and packaging. Extraction/production of chemical raw materials and packaging materials.	Production of product and packaging.	Properties of the chemicals, dosing, work environment, water use, water temperature during use. Wastewater, emissions directly into the water recipient.	Packaging, emissions from waste management.	Transport relating to distribution of raw materials and products.
Energy					
Chemicals					
Other					

The MECO matrix helps us to assess the issue of relevance, in terms of whether there is a health and/or environmental impact associated with materials, energy and chemicals in the different life cycle phases of industrial cleaning and degreasing agents.

The impact is described in more detail below for the various phases.

Raw material phase

Chemical products include a number of different raw materials, such as surfactants, solvents, polymers, inorganic substances, fragrance, preservatives, dyes and complexing agents. Ingredients such as surfactants, polymers and solvents tend to come from fossil raw materials that are not renewable (oil and natural gas), but may also be derived from renewable resources such as oil from plants and animals.

Plastic for packaging comes primarily from fossil sources such as oil and gas. Plastic can also be produced from renewable sources such as maize and sugar cane. The proportion of plastic based on renewable raw materials remains small and such plastic is used primarily in products that have contact with food.

Crude oil is an important resource, as it is used for heating, fuel and production of raw materials for plastic, cleaning agents, paints and pharmaceuticals. However, the oil and gas industry affects large areas of the ocean, seabed and land. The environment is affected by discharges of oil into the sea, for example, during production. Experience from production in Norway shows a change to the fauna on parts of the seabed[22]. In addition, use of oil and gas generates emissions of the greenhouse gas CO_2 and gases such as NO_x and SO_2 which cause acidification.

Renewable raw materials may also constitute an environmental problem, for example with the destruction of tropical rainforest in favour of plantations. Production of biomass and other renewable raw materials can result in large-scale changes to the natural environment, and the cultivation, harvesting and refining of renewable raw materials may occur under conditions that do not take account of the sustainable management of nature, or of the working conditions of the workforce.

Raw material extraction, both for fossil and renewable raw materials, requires energy, and that energy derives primarily from fossil energy sources. In addition, ingredients such as surfactants require additional chemical treatment to create the active surfactants that are eventually included in the finished products.

[22] http://www.miljostatus.no/Tema/Hav-og-kyst/Olje-og-gass/Miljokonsekvenser/

A growing population will drive greater use of raw materials, both renewable and non-renewable, and demand for materials in the future will have a major effect on the environment.

Production phase

Industrial cleaning and degreasing agents may come in liquid or powder form. Powder products tend to be mixed in large vats before they are packaged. The majority of industrial cleaning and degreasing agents come in liquid form. For liquid products, the ingredients are blended with water and possibly a solvent.

When producing plastics, chemicals are added to achieve the required end product.

During production, there is a risk of employees being exposed to the raw materials and the end product. Skin contact and inhalation can lead to health problems for the employees, if protective equipment is not used. The processes are usually automated. During normal operations, the risk of undesirable emissions in conjunction with production is considered to be small.

Use phase

Industrial cleaning and degreasing agents often require specialist application equipment, such as flushing nozzles or floor cleaners. When cleaning production equipment, custom machines are used for each particular industry, with chemical use and water use controlled automatically. All products that have to be applied using machines consume energy during their operation. Most industrial cleaning and degreasing agents do not require warm water and therefore save energy on water heating.

According to some manufacturers, industrial cleaning and degreasing agents are used in large volumes in the Nordic region, but there is no total overview, since the products have so many different areas of use in different industries. Overdosing of products that have to be diluted for use (concentrated products) causes increased consumption and thus higher costs. Overdosing and increased consumption also result in more extraction of raw materials, as well as higher emissions of chemicals into the sewerage system and the water recipient after use.

Poor performance from the products leads to a greater risk of overdosing, since the user will not be satisfied with the results from the stated dosage. For users of industrial cleaning and degreasing agents, it is important that the products are effective in order to minimise operational downtime and costs. Effective performance also reduces the risk of overdosing.

Industrial cleaning and degreasing agents are used in areas that are connected to the municipal sewerage system, and in areas where the products are discharged directly into the water recipients. As far as the constituent raw materials/chemicals in industrial cleaning and degreasing agents are concerned, ecotoxicity and degradability are the key parameters in assessing the environmental impact of the products.

Substances included in the products may also have negative environmental properties other than toxicity. These may be properties of which we are unaware at this time, but which may be discovered in the future. Products and substances that are not broken down after use could therefore cause problems for future generations.

In addition to residues of the cleaning agents, the wastewater contains residues of oil and dirt from the surfaces/areas that are being cleaned. Emissions directly into water recipients such as rivers, lakes and the sea can have major consequences for the biological life there, as it may be vulnerable to changes in pH, salt levels and environmental toxins, for example.

Industrial sources of wastewater often require specialist treatment processes, since the ordinary municipal treatment plants are unable to handle wastewater with high levels of oil/dirt from industry.

Waste phase

The packaging for industrial cleaning and degreasing agents is sent for either reuse, recycling or incineration, and that requires energy. Large volumes require large quantities of packaging.

Transport phase

Nordic Ecolabelling has no concrete information on how transport affects the various phases in the life cycle of the industrial cleaning and degreasing agents, but our experience indicates that the raw materials are usually produced in a country other than the one where the products are sold and used, and may be transported over long distances by road, rail or sea. Life cycle analyses of the transport of raw materials and finished products show that the transport phase often has a lower environmental impact, with less energy consumption, than the extraction of the raw materials.

The products may be ready-diluted or concentrated, and this affects both the amount of packaging and the energy used on transport. Concentrated products require less packaging and less energy for transport.

Environmental impact of industrial cleaning and degreasing agents

Since there is no data on energy consumption in the production phase and use phase, or water consumption for raw material extraction and the use phase, it is a challenge to ascertain where in the life cycle industrial cleaners and degreasers have the greatest impact on the environment.

Based on experience from other areas and an examination of the life cycle phases for industrial cleaning and degreasing agents, the choice of raw materials and the quantity of raw materials required in the end products and packaging are the most important factors in assessing the environmental impact. The products also affect the environment in the use phase. The users are exposed to the products during use, and the dosing and performance are crucial for the amount of the product consumed and the packaging required. The products themselves affect water recipients, either directly or via the wastewater, while the products also carry contaminants that further impact on the environment.

Ecotoxicity and degradability, health, energy (including raw material extraction, packaging and transport), dosing and performance stand out as key parameters in the MECO analysis. The parameters are also assessed based on the scope to tackle the environmental problems (potential) and Nordic Ecolabelling's opportunities to do something about the environmental problems (steerability) by setting requirements for the licensees. The overall assessment, i.e. the possibility of tackling the environmental problems and of

Nordic Ecolabelling setting requirements to resolve the environmental problems, is described in section 5.2.

5.2 Relevance, potential and steerability for industrial cleaning and degreasing agents (RPS)

In order to assess health and environment requirements for different products, Nordic Ecolabelling uses the parameters Relevance, Potential and Steerability (RPS).

Relevance – Is there an environmental problem?

Potential – Can anything be done about the problem?

Steerability – Can Nordic Ecolabelling do anything about the problem?

To achieve environmental benefits, each requirement must be relevant to the environmental problems that exist for the product group in question. There also has to be potential to separate out the products that are better for the environment. It must also be possible to steer the relevant environmental problem through the use of requirements.

The next stage is to assess the potential for reducing health and/or environmental effects in the product's life cycle, before the final judgement is made on whether ecolabelling offers the steerability required to realise the potential for environmental improvement.

In order to set relevant requirements that promote real environmental gains, all three parameters (RPS) must be assessed to establish the existence of Relevance, Potential and Steerability.

5.2.1 Relevance

Relevance is assessed according to the environmental problems that the product group causes and the extent of such problems. The environmental impact of industrial cleaning and degreasing agents is described in detail in section 5.1 as part of the MECO analysis.

5.2.2 Potential

Potential is assessed based on the possible environmental gains within the product group, for each area in the MECO matrix, and for each area in the criteria where requirements are set.

Raw materials
Nordic Ecolabelling is convinced that the environmental consequences of both fossil and renewable raw materials are crucial, and believes it is important that raw materials come from sustainable production as far as possible. Nordic Ecolabelling therefore wishes to promote the use of renewable raw materials where possible. Experience shows that chemtech products may contain a range of raw materials that derive from renewable raw materials, such as surfactants extracted from palm oil. Nordic Ecolabelling has little knowledge of the environmental potential and opportunities for setting requirements concerning production of fossil materials.

Plastic from renewable raw materials saves fossil resources and reduces emissions of CO_2. Assessing the production of raw materials is also important from a life cycle

perspective. Bioplastic currently accounts for < 1% of the world's plastic production, amounting to 1.4 million tonnes in 2012[23]. The industry is, however, expecting considerable growth in the future, rising to 6 million tonnes by 2017. Plastic for packaging can be made from renewable raw materials, but the range and penetration of bioplastic is so small that there is no potential to set requirements for the use of bioplastic in packaging for industrial cleaning and degreasing agents. Bioplastic is used primarily in packaging for food, in part because consumers request bioplastic for food packaging.

Ecotoxicity and degradability

Products containing raw materials with low ecotoxicity and good degradability, both aerobic and anaerobic, affect the environment to a lesser degree than products with non-readily degradable and toxic raw materials. Nordic Ecolabelling is aware of a difference in the content of the different products on the market, not least in terms of levels of substances that are highly harmful to health, and their toxicity and degradability.

Volume

The amount of material used for packaging can vary in size and scope depending on the content, but experience shows that less energy is used in the production of packaging for professional products than for consumer product packaging. Reduced quantities of packaging generate savings, both in the transport phase and in the amount of plastic raw material required for the packaging. Industrial cleaning agents often come in large packs, with relatively small quantities of packaging per dosage. The potential to set the traditional weight-to-benefit ratio requirement is thus not particularly great.

A reduction in the transport of raw materials and finished products should result in lower energy consumption and CO_2 emissions. It is difficult to quantify this effect, since transport takes place at many different stages in a product's life cycle. It is generally the case that energy consumption can be related to whether the packaging contains many or few dosages, i.e. more concentrated products entail less transport per dosage. Encouraging concentrated products could reduce transport and energy consumption.

Usage

Products that have to be diluted with warm water involve greater energy consumption than products that do not. Most industrial cleaning agents tend to be diluted with cold water. In many cases, the product is also used in locations or areas where there is no access to warm water. There is therefore little potential for setting requirements concerning water temperature.

Industrial cleaning and degreasing agents vary in terms of both performance and environmental properties. The products are used in large volumes, and so effective products that are dosed correctly would contribute to reduced consumption, lower costs and lower environmental impact.

Clear dosing instructions and dosing equipment, as well as automatic dosing, reduce the risk of overdosing and thus cut emissions of chemicals. A reduction in raw material

[23] http://www.muoviteollisuus.fi/fin/muovitieto/muovit_ja_ymparisto/biomuovit/
http://www.muoviteollisuus.fi/document.php/1/155/european_bioplastics_-_driving_the_evolution_of_plastics/04345e7cc4b348ac89dfbcf315f356b5
http://en.european-bioplastics.org/bioplastics/
http://en.european-bioplastics.org/market/

extraction means less energy for the extraction and processing of the raw materials and reduced consumption of packaging for the raw materials.

Cleaning machines that use component cleaning agents (multiple products) and CIP products (cleaning in place for pipe systems) tend to have automatic dosing, providing an opportunity to reduce overdosing of the products.

Performance-tested products have shown that they are effective at the stated dosage. This increases the chance that the user will be satisfied with the result, even at the correct low dosage. The performance of the products on the market varies.

5.2.3 Steerability and RPS summary

Steerability is assessed based on the scope to set requirements concerning the relevant environmental parameters that show potential for improvement.

Raw materials
By setting requirements for renewable raw materials in the constituent substances and for bioplastic in packaging, for example, Nordic Ecolabelling wants to promote the use of renewable raw materials. There appears to be little steerability over raw material extraction, since it is not the licensee who owns the raw material producers, buying in the raw materials instead. The raw material industry has begun to work on this, not least through certification of raw materials. It may therefore be possible in the future to set requirements concerning the extraction of raw materials.

Nordic Ecolabelling believes that introducing a range of requirements for the production of renewable raw materials, without also setting requirements for fossil raw materials, may lead to an undesirable shift from renewable raw materials to fossil raw materials. This, as well as the knowledge that opportunities to set requirements for the production of fossil raw materials are poor, means that Nordic Ecolabelling is not seeking to set requirements concerning raw material production in this version of the criteria.

The manufacturers have a major influence over which packaging they use for their products. There are thus good opportunities to set requirements for the packaging. The range and penetration of bioplastic is, however, so small that there is no potential to set requirements for the use of bioplastic in packaging for industrial cleaning and degreasing agents. Nordic Ecolabelling will monitor developments in the industry and, in future criteria development work, will consider the opportunities to set requirements regarding the proportion of bioplastic in packaging.

Ecotoxicity and degradability
Nordic Ecolabelling wishes to exclude and/or limit the use of substances that are harmful to health or the environment and that may be found in industrial cleaning and degreasing agents.

Requirements for low ecotoxicity reduce the amount of toxic substances that are released into the environment. The manufacturers have considerable influence over which raw materials are added to their products and are familiar with the environmental and health effects of each raw material.

By setting requirements that restrict allergens in industrial cleaning and degreasing agents, there is a possibility of reducing the number of new allergy sufferers. Nordic Ecolabelling therefore sees an opportunity to differentiate between the various products and only

ecolabel those with the lowest impact on health. Exposure can be further reduced by using personal protective equipment and automatic dosing.

In the Nordic region, discharge of wastewater from any source other than toilets into the sewerage system always requires permission[24, 25, 26, 27]. This is regulated by national environmental legislation, environmental permits and permits from the water treatment plants. Usually, certain parameters and limit values have to be measured, for example for metals and pH, and there may often be a ban on emitting certain substances (e.g. VOCs) into the sewerage system. The sewerage system does lead to water treatment plants (or some other form of treatment), but since the water treatment plants remove nitrogen and phosphorus and do not break down anything except readily degradable organic compounds, it is relevant to set requirements concerning ecotoxicity and degradability. Products containing constituent substances that are readily degradable will therefore lead to fewer negative consequences.

Nordic Ecolabelling sets requirements that only low levels of allergens may occur in the products and that the products must not contain fragrance. Requirements relating to substances classified as CMR are present in order to ensure that such substances are not included in the products, both out of consideration for the users and others who are exposed, and for the environment.

There are thus good opportunities to set fully steerable requirements concerning ecotoxicity and degradability, where the manufacturers are able to influence the content of their products.

Usage

Nordic Ecolabelling is in a position to require clear dosing instructions to facilitate correct dosing. Concentrated products generally come with a dosing device that is provided by the manufacturers and suppliers. This can help to ensure more accurate dosing. Requirements for user tests and performance tests ensure the performance of the products, since effective products at the correct dosage reduce the need for overdosing

Nordic Ecolabelling therefore sees requirements for dosing and dosing instructions as a way of steering towards more effective products that are used correctly.

Energy

As far as Nordic Ecolabelling is concerned, the steerability of the transport used by the raw material producers and the manufacturers of the cleaning agents is low. Many manufacturers do not own modes of transport (lorries, trains or ships) and on certain routes may also not be able to choose transport options other than lorries, for example.

[24]Finlands Vattenverksförening (VVY), http://www.vvy.fi/pa_svenska, 9.9.2014, Miljöskyddslag 527/2014 http://www.finlex.fi/sv/laki/alkup/2014/20140527

[25] Lag (2006:412) om allmänna vattentjänster, http://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/Lag-2006412-om-allmanna-vat_sfs-2006-412/, http://www.nsva.se/Global/Dokument/ABVA.pdf?epslanguage=sv

[26] LBK nr 879 af 26/06/2010 (Miljøbeskyttelsesloven) https://www.retsinformation.dk/forms/r0710.aspx?id=132218#K5

[27] Forskrift om begrensning av forurensning: Kapittel 15. Krav til utslipp av oljeholdig avløpsvann

6 Background to the requirements

In Nordic Ecolabelling's experience of industrial cleaning and degreasing agents, there is considerable variation between areas of use and industries that use this type of product.

6.1 General environmental requirements

Constituent substances/impurities

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 exempt from the requirements.

Ingoing substances and impurities are defined below, unless stated otherwise in the requirements.

Ingoing substances: all substances in the Nordic Swan Ecolabelled product, including additives (e.g. preservatives and stabilisers) in the raw materials. Substances known to be released from ingoing substances (e.g. formaldehyde, arylamine, in situ-generated preservatives) are also regarded as ingoing substances.

Impurities: residuals, pollutants, contaminants etc. from production, incl. production of raw materials that remain in the raw material/ingredient and/or in the in the Nordic Swan Ecolabelled product in concentrations less than 100 ppm (0,0100 w-%, 100 mg/kg) in the Nordic Swan Ecolabelled product.

Impurities in the raw materials exceeding concentrations of 1,0 % / 0,10 % 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.

The limit of 1.0% impurities in the raw materials has been set to encourage manufacturers to choose goods of high quality that contain very small quantities of trace substances from primary production of the raw materials. The level has been chosen in consideration of the working environment and the classification of the raw material.

Following consultation, it was specified in the criteria document that all product types must meet all requirements, unless otherwise stated.

O1 Information about the product

The product is to be described such that it can be determined that the product falls within the product group definition and that it is thus relevant to show compliance with the other requirements in the criteria document. It is also important that Nordic Ecolabelling has good knowledge of the Nordic Swan Ecolabelled industrial cleaning and degreasing agents. Without this knowledge, it is not possible to determine which criteria are relevant and which criteria should be set for the products in the future. Nordic Ecolabelling therefore requires information about the formulation and intended application method for the products.

Requirement text:

Applicants must provide detailed information about the products included in the application. The following details are to be given:

- Description of the product (production site(s), function and area(s) of use)
- A complete formulation with information on all constituent substances. The formulation for each constituent substance must include:
  - trade name
  - chemical name
  - quantity (% by weight)
  - CAS no. and/or EINECS no.
  - DID no.
  - function

If the raw materials contain several substances, this must be stated.

The DID number is the number an ingredient has on the DID List, which is to be used when calculating the environmental requirements. The DID list can be found on the Nordic Ecolabelling website, see addresses on page 2. See Appendix 5 for more information on the DID list.

☒ Description of the product in line with the definition under "What can carry the Nordic Swan Ecolabel?".

☒ Complete formulation in compliance with the requirement.

☒ Safety data sheet in line with prevailing legislation in the country of application, e.g. Annex II to REACH (Regulation 1907/2006/EC) for each product and each constituent substance in the product.

O2 Classification of the product

Nordic Ecolabelling seeks to ensure that the health and environmental impact of the products is as low as possible. There is therefore a requirement that the products must not be classified as harmful to the aquatic environment, CMR, acutely toxic, having specific target organ toxicity, sensitising or flammable.

CLP stands for Classification, Labelling and Packaging of Substances and Mixtures. CLP is a harmonised system for classification, labelling and packaging of substances and mixes of substances within the EEA. The CLP Regulation is the EU's way of incorporating the GHS (Globally Harmonised System of classification) into European legislation.

Industrial cleaning and degreasing agents need to remove dirty fat/oil and thus need to be stronger than ordinary cleaning agents. They therefore commonly contain solvents that ordinary cleaners do not. The products have be more effective than ordinary cleaners. One consequence of this is less strict requirements concerning product classification for industrial cleaning and degreasing agents compared with ordinary cleaning agents. Industrial cleaning and degreasing agents are handled by professional users, and it is reasonable to expect that training, experience and professional access to the use of the products and protective equipment will safeguard the user to a major extent. As a consequence of this assessment of the products' areas of use and exposure scenarios, Nordic Ecolabelling accepts that industrial cleaning and degreasing agents may be classified as H319 and H318 (Causes serious eye irritation and Causes serious eye damage), H335 (May cause respiratory irritation) and H314 and H315 (Causes severe skin burns and eye damage and Causes skin irritation).

An examination of the classification for degreasing agents (products that are not Nordic Swan Ecolabelled) shows that several industrial degreasing agents, including the market leader in solvent-based products in Finland, are classified as environmentally harmful, which shows the relevance of the classification requirement.

The classifications Flam. Aerosol 1 H222 and Danger, Acute Tox. 3 H311 were added to the criteria following consultation. They appeared in version 2. The table has also been adjusted slightly following consultation, since CLP is the only legislation that now applies. The prohibited classifications remain the same however, except for the above addition of H222 and H311.

Following consultation, the criteria now also state that products may not be labelled "Contains (name of the sensitising substance). May cause an allergic reaction". This means 100 ppm for category 1A sensitising substances and 1000 ppm for category 1 and 1B sensitising substances. It is suggested that MIT is given a harmonised classification, Skin Sens. 1A, and may therefore be included at no more than 100 ppm. Of the other isothiazolinones, BIT, OIT and CMIT/MIT (3:1) have the harmonised classification Skin Sens. 1, CMIT is classified as Skin Sens. 1. These may be included at no more than 1000 ppm.

Requirement text:

The product must not be classified in any of the hazard categories set out in Table O2 below. The classification shall be in accordance with the current legislation (CLP Regulation 1272/2008).

Table O2 – Classification of the product

CLP Regulation 1272/2008:		
Hazard class	**Signal words, Category code**	**Hazard code**
Hazardous to the aquatic environment	Warning, Aquatic acute 1 Warning, Aquatic chronic 1 Warning, Aquatic chronic 2 -, Aquatic chronic 3 -, Aquatic chronic 4 -, Ozone	H400 H410 H411 H412 H413 H420
Carcinogenic	Danger, Carc. 1A or 1B Warning, Carc. 2	H350 H351
Germ cell mutagenicity	Danger, Muta. 1A or 1B Warning, Muta. 2	H340 H341
Reproductive toxicity	Danger, Repr. 1A or 1B Warning, Repr. 2 -	H360 H361 H362
Acute toxicity	Danger, Acute Tox. 1 or 2 Danger, Acute Tox. 1 or 2 Hazardous, Acute Tox. 1 or 2 Danger, Acute Tox. 3 Danger, Acute Tox. 3 Danger, Acute Tox. 3 Warning, Acute Tox. 4 Warning, Acute Tox. 4 Warning, Acute Tox. 4	H300 H310 H330 H301 H311 H331 H302 H312 H332
Specific target organ toxicity	Danger, STOT SE 1	H370

	Warning, STOT SE 2 Danger, STOT RE 1 Warning, STOT RE 2	H371 H372 H373
Aspiration hazard	Hazardous, Asp. Tox. 1	H304
Sensitisation on inhalation or skin contact	Hazardous, Resp. sens. 1 Warning, Skin sens. 1 or products labelled "Contains (name of sensitising substance). May cause an allergic reaction".	H334 H317
Flammable aerosols and liquids	Flam. Aerosol 1 Flam. Liq. 1	H222 H224

Please note that the manufacturer is responsible for the classification.

☒ Label and safety data sheet for the product in line with prevailing legislation in the country of application, e.g. Annex II to REACH (Regulation 1907/2006/EC).

O3 Classification of constituent substances in the product

For the same reasons outlined under requirement O2, there is a requirement that none of the constituent substances may be classified as carcinogenic, mutagenic, reprotoxic or sensitising. The requirement prohibiting sensitising substances is tougher than in the previous version.

Following consultation, two exceptions have been introduced under the requirement concerning classified substances, to bring it in line with other criteria documents:

NTA may occur as an impurity in the complexing agents MGDA and GLDA. NTA is classified as H351, Carc. 2 and is thus prohibited under this requirement, but it may appear as an impurity in the complexing agents MGDA and GLDA in concentrations below 1.0% as long as the level in the end product is lower than 0.1%.

An exception has been made for preservatives and enzymes (including stabilisers and preservatives in the enzyme raw material) with the classification Resp. sens. 1, 1a or 1b H334 and/or Skin sens. 1, 1a or 1b H317. MIT (2682-20-4) is considered to be classified as sensitising. Requirement O2 limits the quantity of Category 1A Sensitising substance to 100 ppm and Category 1 and 1B Sensitising substance to 1000 ppm. With the restrictions inherent in O2, O5 and the Biocidal Products Regulation, there are very few preservatives that comply with both the legislation and ecolabelling criteria. Small quantities of sensitising preservatives are therefore permitted.

The justification for exempting enzymes is that in liquid enzyme raw materials it may be necessary to add stabilisers and preservatives to prevent the enzymes from breaking down and thus losing their effectiveness. This applies, for example, to proteases, where a protease inhibitor is added. Preservatives in enzyme raw materials must be intended only to preserve the raw material, not the end product. The quantity of preservative in the end product is very low, and the preservative serves an important function in a key raw material.

Requirement text:

> The product and raw materials must not contain substances that are or may degrade into substances that are classified as carcinogenic (Carc), mutagenic (Mut), reprotoxic (Rep), or sensitising on inhalation or skin contact according to CLP Regulation (No) 1272/2008.

Constituent substances in the products must also not be classified in any of the hazard categories in table O3.

Table O3 – Prohibited classifications for constituent substances in the product

Hazard class in accordance with CLP Regulation	CLP Regulation 1272/2008
Carcinogenic Category Carc 1A/1B/2	H350 H351*
Germ cell mutagenicity Category Muta 1A/1B/2	H340 H341
Reproductive toxicity Category Repr 1A/1B/2	H360 H361 H362
Sensitisation on inhalation or skin contact Resp. Sens. 1 Skin Sens. 1	H334** H317**

** An exemption is made for NTA as an impurity. Complexing agents of the type MGDA and GLDA may contain NTA as an impurity in the raw material in concentrations below 1.0%, as long as the concentration in the product remains below 0.1%.*

*** The following substances are exempt from the requirement:*

- *Enzymes (including stabilisers and preservatives in the enzyme raw material) may be included in liquid form or as coated granules.*
- *<0.01% by weight of preservative classified as sensitising: Resp. sens 1, 1a or 1b H334 or Skin sens. 1, 1a or 1b H317 may be included in the end product. See requirement O5 for further requirements concerning preservatives. MIT (CAS 2682-20-4) is considered to be classified as sensitising.*

☒ Safety data sheet in line with prevailing legislation in the country of application, e.g. Annex II to REACH (Regulation 1907/2006/EC).

☒ Documentation showing the concentration of any preservatives classified as sensitising.

☒ Safety data sheet or similar showing that any enzymes are in liquid form or in the form of non-dust-forming granules.

☒ Declaration from the manufacturer (Appendix 1).

☒ Declaration from the raw material producer/supplier (Appendix 2).

O4 Environmentally harmful substances

Requirements limiting the content of environmentally harmful substances in industrial cleaning and degreasing agents are essential, since these are products that could end up directly in the aquatic environment, due to them sometimes being used in areas not connected to the sewerage system and water treatment plants. The total content of substances that are classified as harmful to the aquatic environment under current legislation, and that may be included in products, is limited.

Substances that do not break down readily may cause problems now and in the future. The effects can be particularly serious if the substance is also toxic. Limiting these undesirable properties reduces the risk of damage to the environment.

In the majority of other chemical criteria, Nordic Ecolabelling has implemented a weighting formula for environmentally harmful substances, where the parameters restrict substances classified as H410 (Aquatic Chronic 1) most strictly by a factor of 100, while the next classification H411 (Aquatic Chronic 2) is weighted by a factor of 10 and H412 (Aquatic Chronic 3) by a factor of 1. The weighting in the formula is linked to classification limits for each classification.

Experience of Nordic Swan Ecolabelled industrial cleaning and degreasing agents indicates a wide range of different products with very different degrees of dosing. Some products are ready-diluted, while other products are diluted depending on the object to be cleaned and how dirty it is. This makes it hard to set requirements concerning content of environmentally harmful substances in relation to dosing.

It appears that the industrial cleaning and degreasing agents that are currently Nordic Swan Ecolabelled generally do not contain substances classified as environmentally harmful with the code H410, H411 and/or H412. Nordic Ecolabelling wishes, as far as possible, to set requirements that do not permit substances classified as environmentally harmful with the code H410, H411 and/or H412, but has little knowledge of how such a requirement would turn out when, at the same time, the product group is being expanded to include new products about which we do not have the same in-depth knowledge.

In this version of the criteria, the decision has therefore been taken to set requirements concerning a maximum level of substances classified as H410 (aquatic chronic 1), H411 (aquatic chronic 2) and/or H412 (aquatic chronic 3) in terms of % by weight. The limit has been set at 1% by weight, which permits 0.01% preservative classified as H410. This is a substantial tightening of the requirement since version 2.

Requirement text:

No constituent substances with the following environmental hazard classification (in accordance with the CLP Regulation (EC) No 1272/2008) may occur in the product in quantities that exceed the stated limit.

$100*C_{H410} + 10*C_{H411} + C_{H412} \leq 1\%$ in the product

where

C_{H410} is the concentration of substances classified as H410 in percent

C_{H411} is the concentration of substances classified as H411 in percent

C_{H412} is the concentration of substances classified as H412 in percent

Surfactants classified as H412 are exempt from the requirement, as long as they are readily degradable* and anaerobically degradable**.

** In accordance with the DID list or with test method no. 301 A-F, no. 310 or no. 306 (for offshore) in the OECD guidelines for testing of chemicals or other equivalent test methods.*

*** In accordance with the DID list or ISO 11734, ECETOC no. 28 (June 1988), OECD no. 311 or equivalent test methods, where at least 60% degradability is achieved under anaerobic conditions.*

If information about the substance's harmfulness to the environment is not available, the substance is assumed to be environmentally harmful H410.

✉ Report on surfactants that are to be exempted from the requirement (quantity, classification, degradability).

✉ Summary of the product's content of H410, H411 and H412 classified compounds per litre of solution in use, plus calculations showing that the requirement is fulfilled.

✉ Declaration from the manufacturer (Appendix 1).

✉ Declaration from the raw material producer/supplier (Appendix 2).

6.2 Requirements concerning specific substances

O5 Preservatives

Preservatives are added to liquid products with a high water content to prevent bacterial growth in the products. The composition of the product may also affect the need for preservatives.

Preservatives are generally toxic to aquatic organisms and can cause sensitivity and allergic reactions. At the same time, preservatives are necessary to make the products last for a certain period of time. Preservatives may be used in the products and in the constituent raw materials, as long as they are not bioaccumulative. Bioaccumulative substances collect in the fat tissue of living organisms and can cause long-lasting damage to the environment.

Unless otherwise established, substances are deemed bioaccumulative if:

- logKow ≥ 4.0, in line with the OECD's guidelines 107 or 117 or equivalent.
- If the biological concentration factor (BCF) of the substance is ≥ 500 in accordance with the OECD 305 A-E, the substance is deemed bioaccumulative, and if BCF < 500 the substance is deemed non-bioaccumulative.

If there is a measured BCF value, it is always the highest measured BCF that is used to assess the bioaccumulative potential of a substance.

Isothiazolinone biocides and derivatives such as methylisothiazolinone (MIT) and chlormethyl isothiazolinone (CMIT) are commonly used as preservatives to control microbial growth in water-based solutions. Preservatives are often necessary in liquid products with high water content. One of these commonly in use is Kathon, which is a 3:1 blend of CMIT and MIT. Isothiazolinones are highly toxic to fish. Other studies have shown that MIT is allergenic, cytotoxic and neurotoxic[28].

Isothiazolinones and methylisothiazolinone are restricted under requirement O3 Classification of constituent substances, due to their classification as Resp. sens 1 H334 and Skin sens. 1 H317.

Experience of Nordic Swan Ecolabelled industrial cleaning and degreasing agents indicates that many products do not contain preservatives. Nordic Ecolabelling also does not wish to promote products that are diluted to a point that makes preservatives necessary.

To avoid the unnecessary addition of preservatives and to ensure that the quantity of preservatives is sufficient, there is a requirement that the added quantity of preservative must be optimised in terms of the product's volume, and that a test is to be conducted to

[28] Kai He, Jason Huang, Carl F. Lagenaur, and Elias Aizenman Methylisothiazolinone, A Neurotoxic Biocide, Disrupts the Association of Src Family Tyrosine Kinases with Focal Adhesion Kinase in Developing Cortical Neurons THE JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS Vol. 317, No. 3
http://jpet.aspetjournals.org/content/317/3/1320.abstract
Shen Du, BethAnn McLaughlin, Sumon Pal, and Elias Aizenman: In Vitro Neurotoxicity of Methylisothiazolinone, a Commonly Used Industrial and Household Biocide, Proceeds via a Zinc and Extracellular Signal-Regulated Kinase Mitogen-Activated Protein Kinase-Dependent Pathway The Journal of Neuroscience, September 1, 2002, 22(17):7408–7416 http://www.jneurosci.org/content/22/17/7408.full.pdf+html

demonstrate this, for example using a Challenge Test, load test/provocation test or equivalent.

The Challenge Test is an umbrella term for tests that determine the right/necessary quantity of preservatives in products. This is done by adding different concentrations (2%, 1%, 0.5% and 0.25%) of preservatives to a series/range of samples, plus one sample with no added preservative. The samples have a mix of bacteria, yeasts and moulds added and are then tested for the growth of these organisms. The length of a test can vary depending on what is being tested for, and under what conditions the test is being conducted, for example which organisms are being tested for (depending on how the product will be used in the end phase), pH, temperature and so on (if the parameters are not specified in Challenge Tests). The lowest concentration of preservative that produces no growth is the right/optimum amount of preservative for the product. The various manufacturers and suppliers of preservatives have different Challenge Tests[29]/methods that they use to determine the right preservative concentration. These include the Koko Test (test method SM 021), the USP Challenge Test (US Pharmacopoeia) and the CTFA Challenge Test (Cosmetic Toiletries and Fragrance Association).

Requirement text:

- Preservatives may be added to liquid products as long as the preservative is not bioaccumulative. Compounds are considered not to be bioaccumulative if BCF < 500 or logKow < 4.0. If there is data on both BCF and logKow, the value for the highest BCF measured shall be used.
- The concentration of preservative must be optimised in relation to the volume of the product and this must be documented with a Challenge Test (Appendix 5) or equivalent showing this.
- Preservatives are only permitted to preserve the product or raw material, not to provide a disinfecting effect or antimicrobial function.

☒ Documentation that none of the added preservatives are bioaccumulative, cf. OECD test method no. 305 A-E or 107, 117.

☒ Declaration from the manufacturer (Appendix 1).

☒ Declaration from the raw material producer/supplier (Appendix 2).

☒ Test report from the completed Challenge Test or equivalent showing that an optimum concentration of the preservative is used in the product. See Appendix 5 for the requirements concerning the test laboratory, and for information about the Challenge Test.

O6 Dyes

Dyes are added to products primarily for aesthetic reasons. Some raw materials may already be coloured. Professional products may also have dyes added for the sake of colour coding, where the colours of the products ensure the correct use of the products. Although dyes are used in extremely small quantities, they often have undesirable environmental properties (being non-readily degradable). In Nordic Ecolabelling's experience, almost no dyes are used in the products that have been Nordic Swan Ecolabelled in line with the criteria for industrial cleaning and degreasing agents. Since the product group has been expanded to include areas of use where there may be a need to add dye to the products for reasons of colour coding, Nordic Ecolabelling wishes to

[29] Benjamin D. Tanner, Ph.D. - President, Antimicrobial Test Laboratories - Introduction to Preservatives and "Challenge Testing"

permit dyes that are judged not to be bioaccumulative and dyes that are approved for use in food.

Requirement text:

Dyes included in products or in constituent substances must not be bioaccumulative.

Dyes are considered to be bioaccumulative if BCF < 500 or logKow < 4.0. If there is data on both BCF and LogKow, the value for the highest BCF measured shall be used. See Appendix 5 for more information on bioaccumulation. Dyes with an E-number that are approved for use in food are accepted.

✉ Documentation that none of the added dyes are bioaccumulative, cf. OECD test method no. 305 A-E or 107, 117 or state E-number.

O7 Volatile organic compounds (VOC)

Volatile organic compounds are to be considered of particularly concern due to their inherent properties. They can be absorbed through the lungs and skin and cause damage to various organs. Prolonged exposure to certain organic solvents can cause chronic damage to the brain and nervous system, while other organic solvents can cause cancer or reproductive damage. Solvents may also cause headaches and irritation of the eyes and airways. They can also have negative effects on ground level ozone and they are often not readily degradable in the ecosystem.

A number of industrial cleaning and degreasing agents, particularly those intended to remove heavily oiled dirt from surfaces, contain volatile organic solvents. Commonly used solvents include hydrocarbons, aromatics, alcohols, ketones, esters, pyrrolidones and glycol ethers.

Experience indicates that levels of VOCs in industrial cleaning and degreasing agents have been low, but following the expansion of the product group, there is not enough information to determine whether VOCs can be entirely excluded from the products.

In addition, the VOC definition has been amended in version 3 (the definition is now in line with the VOC Directive 1999/13/EC: Volatile organic compounds (VOC) are organic substances with a vapour pressure > 0.01 kPa at 20°C, which means some substances which were not considered a VOC under the previous definition (vapour pressure 2.5 kPa at 20°C) are now defined as a VOC.

Nordic Ecolabelling always seeks to limit the content of volatile organic compounds, but at the same time realises that on occasion these compounds have an important function in ensuring effective products. They are needed in applications where water cannot be used, for example in the metal industry, where there is a need to remove organic particles or wax before surface treatment. It is therefore not possible to exclude VOCs from all types of industrial degreasers, if Nordic Ecolabelling wishes to encompass a broad spectrum of products in this product group.

In Nordic Ecolabelling's experience, solvents differ in their properties. Some have more serious health and environmental hazard classifications than others. Several solvent-based products on the market today contain aromatic hydrocarbons or are classified as environmentally harmful. Nordic Ecolabelling wishes to promote the use of better solvents and therefore sets separate requirements concerning solvents in solvent-based products that can only be used where there is no alternative degreasing agent.

Requirements concerning the classification of products and constituent substances ensure that the worst solvents in terms of health are excluded from use, and requirements concerning degradability ensure that the use of non-readily degradable solvents is limited. Nordic Swan Ecolabelled cleaning agents must also not be classified as environmentally harmful, as is commonly the case for solvent-based products that are not Nordic Swan Ecolabelled.

The requirement concerning solvents has been tightened up. Aromatic solvents are now totally prohibited and a new definition has made the requirement concerning water-based products stricter. Requirements concerning solvent-based products have also been tightened by restricting the area of use, and advice is to be given on how the product is to be used so that health risks are minimised. In addition, solvents with a vapour pressure of > 2.5 kPa at 20°C must not be used at all; previously there was a limit of 1%. The level of 2.5 kPa at 20°C has been arrived at by checking the vapour pressure and aromatic content of over 30 cleaning agents based on organic solvents used in the graphics industry[30]. Of these cleaning agents, no more than four fulfil the requirement concerning both vapour pressure (< 2.5 kPa) and aromatic content (prohibited in version 3).

Other ecolabels permit VOCs in their products. Environmental Choice in New Zealand permits up to 10% VOCs (EU definition of VOC) and prohibits halogenated solvents, while GreenSeal USA permits up to 5% VOCs (EU definition).

Requirement text:

Solvent-based products:
Only volatile organic compounds* with a vapour pressure < 2.5 kPa at 20°C that meet all other requirements in the criteria may be used.

These may only be marketed and sold for degreasing metal components, machinery and tools which cannot tolerate water.

Such products must be accompanied by health and safety instructions about the importance of ventilation when using the product.

Note that requirement O2 prohibits products classified as environmentally harmful, requirement O6 prohibits halogenated and aromatic solvents and requirement O11 limits the quantity of aerobically and anaerobically non-biodegradable substances.

Other products:
Volatile organic compounds* may account for 1% by weight of the solution in use at the maximum recommended dosage.

** Volatile organic compounds (VOC) are defined under the VOC Directive 1999/13/EC as follows: Volatile organic compounds (VOC) are organic substances with a vapour pressure > 0.01 kPa at 20°C.*

☒ Declaration from the manufacturer (Appendix 1).

☒ Declaration from the raw material producer/supplier (Appendix 2).

☒ Solvent-based products: Documentation showing the vapour pressure of all solvents, plus a label or product data sheet showing the area of use and the health and safety instructions. Solvents must also meet all other requirements in the criteria.

☒ Other products: Calculation of the VOC content of the product.

O8 Phosphorus

Phosphate is a complexing agent for lime and an auxiliary chemical for surfactants. The use of phosphorus is permitted in limited amounts in some of Nordic Ecolabelling's

[30] Study of solvents in the graphics industry, 2004, Nordic Ecolabelling (internal study, not published)

criteria, where it has been judged to be a benefit. Eutrophication is caused primarily by the nutrients nitrogen and phosphorus. Eutrophication of lakes, oceans and watercourses causes a lack of oxygen that in turn creates dead zones. Norway and Sweden have specific national restrictions for phosphorus that have to be taken into account[31].

The Norwegian Product Regulation governs the phosphorus content of washing and cleaning agents for industrial and professional use. For concentrates for professional use in enclosed systems with automatic dosing, the limit values apply after dilution to a usable solution.

Phosphates from washing and cleaning products play a minor role in areas where phosphorus is removed from wastewater. With the expansion of the product group to include outdoor products, there is an increased risk that Nordic Swan Ecolabelled industrial cleaning agents could directly end up in the water recipient. Requirements concerning phosphorus are therefore extra important.

Experience of Nordic Swan Ecolabelled industrial cleaning and increasing agents indicates that some products, often of the type deep cleaning or degreasing, contain tetrasodium pyrophosphate in quantities of less than 0.5 g P per litre of solution in use. Products that are ready-diluted have a higher content of phosphorus per litre of solution in use.

The requirement was previously 2.0 g P per litre of solution in use. In this version, the requirement has been tightened to 0.5 g P per litre of solution in use. Nordic Ecolabelling wishes to promote concentrated products and therefore does not wish to introduce specific requirements for ready-diluted (RTU – ready to use) products.

Phosphorus and phosphonates are not permitted in products for outdoor use, since these are products that may be carried directly into the water recipient and not to a water treatment plant. An exemption from this requirement applies to products for use offshore, where a limited quantity of phosphorus is permitted in the products (0.5 g P per litre of solution in use).

International rules set by the IMO (International Maritime Organization) for products for ships and offshore regulate the discharge of tank wash water in coastal areas, for example. In international waters, it is permitted and accepted that phosphates may be found in cleaning agents. The conditions and risk of eutrophication are considered to be different compared with coastal areas, watercourses and lakes. Products for use in coastal areas, watercourses and lakes, including freshwater and brackish areas such as the Baltic Sea, must not contain phosphorus.

Phosphonates (DID no. 2512) are a number of phosphorus compounds that are very good complexing agents[32]. The compounds are not harmful to aquatic organisms, but are persistent and anaerobically non-biodegradable. Phosphonates contain phosphorus, but are used in significantly smaller quantities than phosphate, due to their extremely good properties as complexing agents.

[31] Produktforskriften: FOR 2004-06-01 nr 922 : Forskrift om begrensning i bruk av helse- og miljøfarlige kjemikalier og andre produkter. Kapitel: 2-12 . Vaskemidler - innhold av fosfor
[32] Lindquist, 2002: Information om kompleksbindingspotentialer, udleveret af Hans Lindquist i forbindelse med kriterieudvikling for Maskinopvaskemidler til professionelt brug, 2002.

Phosphonates are neither aerobically or anaerobically degradable, and it is therefore desirable to limit them as far as possible. The restriction of phosphorus therefore also applies to the phosphorus that derives from phosphonates.

Requirement text:

Phosphorus must not be included in products for outdoor use. The exception is products for use offshore* which may contain 0.5 g P per litre of solution in use.

Phosphorus in products for indoor use must not amount to more than 0.5 g P per litre of in-use solution.

** Products for offshore use that are approved in the green or yellow category under HOCNF (Harmonised Offshore Chemicals Notification Format), but not products for use in coastal areas, watercourses and lakes, including freshwater and brackish areas such as the Baltic Sea.*

Be aware of national legislation on phosphorus where the product will be sold/marketed. In Norway, phosphorus is regulated in sections 2-12 and 2-14 of the "Regulation limiting the use of chemicals and other products that are harmful to health and the environment (The Product Regulation)".

☒ Declaration from the manufacturer (Appendix 1).

☒ Declaration from the raw material producer/supplier (Appendix 2).

☒ Calculation of the quantity of phosphorus added (calculated as elementary phosphorous, P) per litre of in-use solution.

☒ For products for offshore use that contain phosphorus: Documentation showing that the products are approved in the green or yellow category under HOCNF, procedures that describe how it is ensured that these products are not used in coastal areas, watercourses and lakes, including freshwater and brackish areas such as the Baltic Sea, plus the label and user information clearly indicating the area of use and that these products must not be used in coastal areas, watercourses and lakes, including freshwater and brackish areas such as the Baltic Sea.

O9 Substances that must not be present in the products

Nordic Ecolabelling addresses environmental problems relating to industrial cleaning and degreasing agents by setting requirements that limit certain constituent substances and by prohibiting a range of problematic substances, particularly substances that are not restricted by other requirements, for example regarding classification.

Nordic Ecolabelling prohibits the following substances in industrial cleaning and degreasing agents:

Alkylphenol ethoxylates (APEO) and/or alkylphenol derivatives (APD) are a group of surfactants that been proven harmful to health and non-readily degradable. Some substances also have endocrine disrupting properties. Due to official regulations, the substances have been phased out of most products, but we have occasionally found the substances in raw materials.

EDTA (ethylene diamine tetra acetate and salts thereof) and DTPA (diethylenetriamine penta acetate) are suspected of being able to mobilise heavy metals in certain environments due to their complexing capacity. The industry has rightly raised this property as a potential problem.[33] EDTA is not readily degradable, and the EU risk assessment states that given the conditions of municipal treatment plants, EDTA will not be degraded at

[33] CEFIC, 2003: Information from Internet about EDTA, found on http://www.cefic.org/Documents/Other/B013.doc, from European Aminocarboxylates Committee (EAC), March 2003.

all or be degraded only to a limited extent.[34] DTPA has the same properties as EDTA. For many industrial cleaning and degreasing agents, the products will be fed directly into the water recipients, and not to a municipal water treatment plant. Nordic Ecolabelling therefore wishes to prohibit them, as there are environmentally better alternatives on the market.

Under the CLP Regulation NTA is classified as Carc. 2 with H351 and is therefore prohibited under requirement O3. NTA may occur as an impurity in the complexing agents MGDA and GLDA.

Organic chlorine compounds and hypochlorites
Sodium hypochlorite or organochlorides such as triclosan are used as disinfecting/anti-bacterial substances. These can be, or lead to the formation of, toxic, non-readily degradable and bioaccumulative substances. They can also lead to bacterial resistance against biocides and antibiotics. As such, Nordic Ecolabelling wishes to exclude these from use, even though they are not commonly used in industrial cleaning and decreasing agents.

Halogenated and aromatic compounds
Halogenated organic compounds include many substances that are harmful to the environment and health, highly toxic for aquatic organisms, carcinogenic or harmful to health in other ways. Halogenated organic compounds tend to have low degradability in the environment, which also increases the risk of harmful effects from the substances.

Aromatic hydrocarbons generally comprise one or more benzene rings (polycyclic aromatic hydrocarbons, PAH) and substances such as benzene, toluene, phenol and naphthalene. PAHs can be found in oil, coal and tar, and are carcinogenic, mutagenic and reprotoxic. In this version of the criteria, the requirement concerning content of aromatic solvents has been tightened.

Halogenated organic compounds and aromatic solvents must not be contained in Nordic Swan Ecolabelled industrial cleaning and degreasing agents.

Volatile organic solvents may be present to a maximum of 1% by weight. See requirement O6.

Fragrance may contain substances that are harmful to health and the environment.

Nordic Ecolabelling has always focused on fragrance in Nordic Swan Ecolabelled products and has noted an active debate surrounding allergenic fragrances, particularly in Denmark.

Allergies are a growing problem, and people with allergies can have allergic reactions on contact with products containing substances that we know are allergenic.

Fragrance has no functional effect in the products and is often classified as toxic to the environment (e.g. H411, Toxic to aquatic life with long lasting effects). In addition, most fragrances are classified as allergenic (H317, May cause an allergic skin reaction or H334, May cause allergy or asthma symptoms or breathing difficulties if inhaled).

[34] CEFIC, 2002: Information from Internet about EDTA, found on http://www.cefic.org/Documents/Other/C014.doc, from European Aminocarboxylates Committee (EAC), June 2002.

Fragrance must not be contained in Nordic Swan Ecolabelled industrial cleaning and degreasing agents.

Quaternary ammonium compounds are often cationic surfactants that tend to have undesirable environmental effects. They are used in washing and cleaning agents and are often not degradable. There are sub-groups (e.g. esterquats) with better environmental properties, such as being readily degradable. Quaternary ammonium compounds (QAC) are often highly toxic to aquatic organisms and this, combined with the fact that they are not readily degradable, results in long-term effects in the aquatic environment and potentially accumulation in the environment. Quaternary ammonium compounds that are not readily degradable are therefore prohibited.

One of the more widely known and often undesirable quaternary ammonium compounds is the biocide benzalkonium chloride (classified as Aquatic Acute 1 with H400), which is readily degradable, in contrast to many of the other compounds. Benzalkonium chloride is undesirable due to its toxicity and the risk of encouraging resistance and certain types of allergies[35, 36].

"Substances of Very High Concern" (SVHC) is a term that describes the substances that meet the criteria in Article 57 of the REACH Regulation, i.e.: substances that are CMR (category 1 and 2 under the Dangerous Substances Directive 67/548/EEC or category 1A and 1B under the CLP Regulation), PBT substances, vPvB substances (see section below) and substances that have endocrine disruptive properties or are environmentally harmful without meeting the criteria for PBT or vPvB. SVHC may be included on the Candidate List with a view to later inclusion on the Authorisation List. This means that the substance becomes regulated (ban, phasing out or some other form of restriction). Due to these undesirable properties, Nordic Ecolabelling prohibits substances on the Candidate List. Other SVHC substances are dealt with through a ban on PBT and vPvB substances and through requirements concerning classification and a ban on endocrine disruptive substances.

PBT (Persistent, bioaccumulative and toxic) and vPvB (very persistent and very bioaccumulative)[37] are organic compounds defined in Annex XIII of REACH (Regulation (EC) No 1907/2006)[38]. Nordic Ecolabelling generally does not want such substances to be included in the products.

Most PBT/vPvB are automatically excluded from industrial cleaning and degreasing agents due to the restrictions on environmentally harmful substances (see O4). Since some, particularly vPvB, may not be excluded under O4, Nordic Ecolabelling prohibits these specifically.

Potential endocrine disruptors are substances that may affect the hormone balance in humans and animals. Hormones control a number of vital processes in the body and are particularly important for development and growth in humans, animals and plants. Changes in the hormone balance can have unwanted effects and here there is an extra focus on hormones that affect sexual development and reproduction. Several studies

[35] Heir et al, 2001: Kan desinfeksjionsmidler bidra til bateriell antibiotikaresistens? Tidsskrift for Den norske Legeforening nr. 27, 2001, Even Heir, Solveig Langsrud, Maan S. Sidhu & Martin Steinbakk, 2001.
[36] Wikipedia Benzalkonium Chloride, 2012: Information from Internet about Benzalkonium Chloride found on Wikipedia, http://en.wikipedia.org/wiki/Benzalkonium_chloride, 2012.
[37] http://esis.jrc.ec.europa.eu/index.php?PGM=pbt
[38] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:136:0003:0280:en:PDF

have shown effects on animals that have been traced to changes in hormone balance. Emissions to the aquatic environment are one of the greatest sources for the spread of endocrine disruptors[39]. Nordic Ecolabelling bans the use of substances that are considered to be potential endocrine disruptors, category 1 (there is evidence of a change in endocrine activity in at least one animal species) or category 2 (there is evidence of biological activity related to changes in hormone balance), in line with the EU's original report on "Endocrine disruptors"[40] or later studies[41].

Nanoparticles: Nanotechnology, which also includes nanoparticles, is being used to an increasing extent in many product areas, including those for which Nordic Ecolabelling has criteria. The greatest cause for concern is the use of nanoparticles that may be released and affect health and the environment. There is a worry among public bodies, environmental organisations and others about the lack of knowledge regarding the potential damaging effects on health and the environment.

The European Commission issued an agreed definition of nanomaterials on 18 October 2011, which states that: "A nanomaterial is a natural, incidental or purposely manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for at least 50% of the particles in the number size distribution, one or more external dimensions is in the size range 1-100 nm. "Nordic Ecolabelling subscribes to this definition, but judges for itself what limits to set in the different product groups. In the recently revised "Criteria for the Nordic Ecolabelling of Cleaning Products", Nordic Ecolabelling set a limit value of 1% in order to cover more materials with a proportion of nanoparticles. Nanoparticles must not be contained in Nordic Swan Ecolabelled industrial cleaning and degreasing agents. This is a new requirement in this version of the criteria.

Requirement text:

The following compounds must not be present in the product:

- APEO and APD (alkylphenol ethoxylates and alkylphenol derivatives)
- EDTA (ethylene diamine tetra acetate and salts thereof) and DTPA (diethylenetriamine penta acetate)
- Organic chlorine compounds and reactive chlorine
- Halogenated and aromatic solvents

Solvents defined in line with the the VOC Directive 1999/13/EC: organic substances with a vapour pressure > 0.01 kPa at 20°C.

- Phthalates
- Fragrance
- Quaternary ammonium compounds that are not degradable

[39] Miljøstatus i Norge (2008): Hormonforstyrrende Stoffer. http://www.miljostatus.no/Tema/Kjemikalier/Noen-farlige-kjemikalier/Hormonforstyrrende-stoffer/#D (dated February 26 2009)
[40] Towards the establishment of a priority list of substances for further evaluation of their role in endocrine disruption. FINAL REPORT. European Commission DG ENV / BKH Consulting Engineers with TNO Nutrition and Food Research. 21 June 2000. http://ec.europa.eu/environment/archives/docum/pdf/bkh_main.pdf
[41] EU (2002a): Study on the scientific evaluation of 12 substances in the context of endocrine disruptor priority list of actions. European Commission DG ENV / WRc-NSF. November 2002
http://ec.europa.eu/environment/endocrine/documents/wrc_report.pdf
EU (2002b): Study on gathering information on 435 substances with insufficient data. FINAL REPORT. European Commission DG ENV / BKH Consulting Engineers. 15 November 2002
http://ec.europa.eu/environment/endocrine/documents/bkh_report.pdf#page=1

- Benzalkonium chloride
- Substances on the Candidate List*
- Substances that have been judged in the EU to be PBT (Persistent, Bioaccumulative and Toxic) or vPvB (very Persistent and very Bioaccumulative), in accordance with the criteria in Annex XIII of REACH (Regulation 1907/2006/EC).
- Substances considered to be potential endocrine disruptors in category 1 or 2 on the EU's priority list of substances that are to be investigated further for endocrine disruptive effects. See following link:
  http://ec.europa.eu/environment/chemicals/endocrine/pdf/final_report_2007.pdf
- Nanoparticles (from nanomaterials**)

** The Candidate List can be found on the ECHA website: http://echa.europa.eu/candidate-list-table*

*** The definition of a nanomaterial follows the European Commission's definition of nanomaterials from 18 October 2011, with the exception that the limit for the particle size distribution is reduced to 1%: "A natural, incidental or purposely manufactured material containing particles, in an unbound state or as an aggregate, where at least 1% of the particles have one or more external dimensions in the size range 1-100 nm." Examples include ZnO, TiO_2, SiO_2, Ag and laponite with particles of nanosize in concentrations above 1%. Polymer emulsions are not considered to be a nanomaterial.*

✉ Declaration from the manufacturer (Appendix 1), declaration from the raw material producer/supplier (Appendix 2).

6.3 Degradability and CDV

Degradability

The persistence of substances in nature is an important environmental parameter. The degree to which substances break down in an aquatic environment gives some indication of how long a substance may affect the environment. The degrading of substances in an aquatic environment depends on whether oxygen is present in the recipient body of water. Reference is therefore made both to aerobic (with oxygen) and anaerobic (without oxygen) degradability.

When it comes to chemicals, by limiting the content of organic substances that are not aerobically and anaerobically degradable, we ensure that no more substances are discharged into the environment than is necessary.

O10 Surfactants, readily aerobically and anaerobically degradable

A basic tenet of the Detergents Regulation is that all surfactants must be readily degradable. If a substance fails to comply with this, but is intended exclusively for professional use, special dispensation may be sought such that substances only have to be potentially degradable. The requirement concerning anaerobic degradability is thus set as a marker that Nordic Ecolabelling believes substances emitted into the environment should be degradable whatever environment they end up in. It is considered relevant in this context, since surfactants have been found in sludge intended as fertiliser on farmland. The discovery of these substances indicates that degradation of sludge/soil is not guaranteed, even if the substances are degradable in an aerobic aquatic environment. Since these criteria apply only for professional use and dispensation from the Detergents Regulation may be sought for these products, it is relevant to set requirements for both aerobically and anaerobically degradable surfactants.

The requirement means that LAS (linear alkyl benzene sulphonate) cannot be included in industrial cleaning and degreasing agents, for the reason that LAS is not degradable in an anaerobic environment.

In accordance with the requirements concerning substances on the PLONOR list (see section 3.5.3 for more information), the surfactants in products for use offshore must be tested for aerobic degradability in line with OECD 301 or OECD 306. Under a specific Norwegian regulation,[42] the substances in products for use offshore must be tested in accordance with OECD 306, which is a saltwater test.

Requirement text:

> All surfactants must be readily aerobically degradable in accordance with test method no. 301 A-F or no. 310 in the OECD guidelines for testing of chemicals or other equivalent test methods.
>
> For products for use offshore, i.e. products that risk running directly into the ocean, the surfactants must also be readily degradable in accordance with OECD 306.
>
> All surfactants must be anaerobically degradable, which means at least 60% degradability under anaerobic conditions, in accordance with ISO 11734, ECOTOC no. 28, OECD 311 or equivalent test methods.
>
> Documentation shall, in the first instance, refer to the DID list dated 2014 or later. For surfactants not covered by the list and for the requirement concerning offshore products with regard to OECD 306, other documentation such as test reports or literature references may be used (see Appendix 5).

✉ Documentation is required for each surfactant, showing that the surfactant is readily biodegradable and anaerobically degradable in line with the requirements above.

O11 Aerobic degradability, aNBO and Anaerobic degradability, anNBO

The persistence of substances in nature is an important environmental parameter. The degree to which substances break down in an aquatic environment gives some indication of how long a substance may affect the environment. The degrading of substances in an aquatic environment depends on whether oxygen is present in the recipient body of water. Reference is therefore made both to aerobic (with oxygen) and anaerobic (without oxygen) degradability. Anaerobically non-biodegradable substances are organic substances that, under anaerobic conditions, do not break down in the environment, which can lead to problems such as algal blooms and a resulting shortage of oxygen.

The amount of aerobically and/or anaerobically non-biodegradable substances varies from product to product. Industrial cleaning and degreasing agents may contain limited quantities of organic substances that are not aerobically and/or anaerobically degradable. When it comes to chemicals, by limiting the content of organic substances that are not aerobically and anaerobically degradable, we ensure that no more substances are discharged into the environment than is necessary. The requirement remains unchanged, since Nordic Ecolabelling has insufficient information on how the requirement level will work for new product areas.

Requirement text:

> The quantity of organic substances that are aerobically non-biodegradable (aNBO), in accordance with the DID list, must not exceed 0.6 g/litre of solution in use.

[42] Harmonised Offshore Chemical Notification Format OSPAR Recommendation 2010/13, Supplementary guideline for the Norwegian sector, point 57.

The quantity of organic substances that are anaerobically non-biodegradable (anNBO), in accordance with the DID list, must not exceed 0.6 g/litre of solution in use.

Note that all surfactants must be aerobically and anaerobically degradable in accordance with O10.

For substances that are not on the DID list or do not have data on anaerobic degradability, other documentation in accordance with Appendix 5 may be submitted.

✉ Calculation of total quantity of organic substances that are aerobically non-biodegradable (aNBO) and calculation of total quantity of organic substances that are anaerobically non-biodegradable (anNBO) in the solution in use in accordance with the DID list. For substances not on the DID list, other documentation in accordance with Appendix 5 may be submitted. The parameters and calculation formulas needed for documentation of the requirement can be found in Appendix 5.

DID list: Detergents Ingredients Database.

O12 CDV (critical dilution volume)

There are several ways of handling a product's overall toxicity and degradability. The primary means is to assess the product's critical dilution volume (CDV). There should therefore be a requirement concerning CDV for products that end up in the aquatic environment after use. The critical dilution volume is a theoretical value that takes account of the individual substance's chronic toxicity and degradability in the environment.

There has previously been no CDV requirement for industrial cleaning and degreasing agents, so in order to consider such a requirement and the level at which it should be set, it has been necessary to conduct CDV calculations for sample products. Industrial cleaning and degreasing agents have very different functions. In Nordic Ecolabelling's experience from other product areas in which it has criteria, the CDV values often relate to the product's function and naturally its level of dilution. An examination of Nordic Swan Ecolabelled industrial cleaning and degreasing agents shows that the CDV levels vary to a great degree.

The decision has therefore been taken to set CDV requirements depending on the product's area of use and dosage. Solvent-based products are often used undiluted and for specific purposes. CIP and component cleaning agents tend to be used in < 5% solution and have their own limit value. Façade cleaners, pre-painting cleaners and window cleaners are used outdoors, although pre-painting cleaners may also be used indoors. They are all similar products and therefore have a shared limit value. Offshore is a new product group for us and we do not have sufficient data to set CDV requirements at this time. We are therefore setting the limit at 1,000,000, equalling the highest limit value for water-based degreasing agents. Water-based products include strongly and weakly alkaline products and acidic products that are used for cleaning surfaces and in pressure washing, usually at a dilution of 2-30%. The limit values are based on a study of Nordic Swan Ecolabelled products.

The type of product concerned with regard to the divisions in the CDV requirement has been introduced as a parameter to be specified as part of the performance text, see the appendices for the user and lab tests.

Requirement text:

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

Table O12 – CDV (critical dilution volume)

Product type	Req. CDV chronic (litres/solution in use)
Water-based degreasers (surfaces, metal/engine cleaning)	1,000,000
CIP, component cleaning agents	100,000
Pre-painting cleaners, façade cleaners	50,000
Solvent-based products (Ready-to-use, RTU)	500,000
Offshore	1,000,000

CDV chronic is calculated using the formula below and is calculated for all substances in the product.

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

Where:

$dose_i$ = the quantity of the individual substance $_i$ used in g/litre of solution in use, DF_i = degradability factor for substance $_i$ as stated in the DID list

TF_{acute} = chronic toxicity factor for substance $_i$ as stated in the DID list.

The calculation of CDV is applied to the highest stated solution in use (g/litre of solution in use).

Hydrochloric acid, HCl, is exempt from the calculation.

Documentation shall, in the first instance, refer to the DID list dated 2014 or later. For substances not covered by the list, the parameters must be calculated using the guidance in part B of the DID list, and the associated documentation is to be submitted.

☒ Calculation of $CDV_{chronic}$ for the product based on all constituent substances. Nordic Ecolabelling's websites provide a calculation sheet that may be used for the calculation.

6.4 Performance

Performance tests are primarily a quality requirement to ensure that a good cleaning result is achieved with the stated dosage of the ecolabelled product. A product that offers good performance at the dosage stated by the manufacturer reduces the risk of overdosing.

During the consultation, Nordic Ecolabelling wished to explore the possibility of documenting the performance of the product using only a user report. This entailed removing the possibility of testing the product's performance in a laboratory test. The reason for this was that Nordic Ecolabelling had received criticism that the laboratory performance tests required for the Nordic Swan Ecolabel, at a time when standardised international tests did not exist, failed to ensure that Nordic Swan Ecolabelling products were among the best quality products on the market. Calls for standardised tests for product types such as industrial cleaning and degreasing agents were also received over the course of the consultation.

Feedback from respondents to the consultation and contact with the industry during the consultation period show that there are no known/recognised standardised tests for the performance of these products. Although there are no standardised performance tests, it is important that Nordic Ecolabelling retains the option of conducting a laboratory test, where the product is tested against another product on the market.

Nordic Ecolabelling has therefore chosen to draw up a framework for conducting a laboratory test as an alternative to the user report. The laboratory test has been adjusted and adapted to industrial cleaning agents, following dialogue with manufacturers, in order to improve the quality of the test.

The laboratory test may be conducted as specified in Appendix 4 or as some other laboratory test that is well described and documented. The alternative laboratory test must be approved by Nordic Ecolabelling.

The requirement concerning performance means that the product must be at least as good as or better than the product with which it is compared.

The product must have satisfactory performance within the areas of use for which the product is intended. This may be documented with a user report (O13) or a laboratory test (O14) per area of use.

O13 Performance test – user reports

The performance of the product must be satisfactory for the area of the product. This can be documented either by user reports (O13) or a laboratory test (O14) for each area of use.

Requirement text:

The performance of the product must be documented by means of user reports (see Appendix 3). The product must be used by at least five relevant industrial users within the area of use of the product for a period of time that is representative of the frequency of use of the product, (i.e. the product must be used repeatedly).

✉ A minimum of five user reports (as formulated in Appendix 3) must be submitted by at least five relevant industrial users of the product. The user reports must show that at least 80% of the users are satisfied with the product.

O14 Performance test – laboratory test

Requirement text:

The product's performance must be tested using a test method that meets the conditions set out in Appendix 4. Assessment and documentation of the product's performance must show that the product performs better than or as well as the product it is being compared with, and better than water.

✉ Laboratory test documenting satisfactory performance (assessment of performance, description of test method and test results) in accordance with the conditions set out in Appendix 4.

6.5 Packaging and user information

O15 PVC in packaging

According to the report "Plastics – the Facts 2013" from Plastics Europe[43], packaging is the largest sector for the plastics industry in Europe, representing 39.4% of the total demand for plastic. Figure 8 in the report shows that the most commonly used plastic is PE-LD/LLD, followed by PEHD, PP, PET and PS, then PVC. Grønt Punkt in Norway states that PVC accounts for around 1% or less of packaging waste. However, much of

[43] Plastics Europe 2013

any plastic waste is likely to end up in residual waste, so the total quantity of PVC packaging waste is uncertain.

The majority of bottles used for packaging chemical products are made from polypropylene (PP) or polyethylene (PE), although certain types of packaging may still be made from PVC. Auraprint, which supplies labels to Finnish chemical product manufacturers that hold a Nordic Swan Ecolabelling licence, reports that the most common materials used for labels are PP, PE, PET and paper[44]. Auraprint has stopped making labels from PVC, and believes that most other producers have done the same. An internet search shows that it is still possible to find PVC packaging, particularly for cosmetic products, and PVC labels from label producers outside the Nordic region[45].

Requirement text:

PVC and other halogenated plastics shall not be part of the primary packaging or packaging components (including caps, lids, pumps and labels).

✉ Declaration from the manufacturer. Packaging overview stating packaging type.

O16 Labelling of packaging

Nordic Ecolabelling would like to see as much packaging as possible being recycled. A requirement has therefore been set to facilitate the sorting of plastic packaging with a view to recycling. This has traditionally involved requiring that plastic packaging should be labelled with a plastic identification mark in line with current standards. The requirement has, however, not applied to caps, lids and pumps.

Modern plastics recycling operations no longer employ manual sorting of plastic waste. Such waste is instead sorted optically using NIR (Near Infrared Spectroscopy) or by density in a water bath. Large volumes of mixed plastic thus appear to go through automated sorting, but DIN labelling is still used in certain situations. The environmental relevance of the requirement is therefore debatable, but there are grounds to retain the requirement. In Norway and Sweden, much of the commercial plastic waste is still sorted manually and DIN labelling can be useful in this context. There is therefore a requirement concerning DIN labelling of packaging for industrial cleaning agents.

Requirement text:

The plastic packaging must carry information on the components and materials from which the packaging is made and how these should be sorted. It may be marked in accordance with European standards (e.g. DIN 6120 part 2), recommendations from national waste collection agencies or equivalent.

Caps, lids and pumps are exempted from this requirement.

✉ Picture of the product's labelling or data sheet showing the labelling. The labelling may also be indicated by the label, if this is accompanied by documentation for the type of plastic from the packaging manufacturer.

O17 Information for users

One important environmental parameter is that the products should be used for their intended purpose and that products which require diluting before use should be correctly dosed. Incorrect use of cleaning products, including overdosing, leads to an unnecessary and increased burden on the environment. It is therefore important that the product is

[44] Ääritalo, 2012
[45] Plastemballage 2013

accompanied by clear information, so that the user can easily see how much the product needs to be diluted to achieve the best results.

To avoid overdosing of concentrated products, packaging must be designed to help with correct dosing. For products that require diluting, there must be clear and simple dosing instructions on the packaging.

The dirt to be removed during cleaning often has a greater impact on the environment than the cleaning agents themselves. The user must therefore be informed of the importance of ensuring, as far as possible, that wastewater from washing using this type of cleaning agent does not end up directly in the water recipient, but is mostly collected and sent for treatment.

Requirement text:

A technical description of the product or information in all relevant Nordic languages that accompanies the product, which must contain the following information:

- Product type and area of use.
- Recommended dosage for normal use and normal soiling (applies to products that have to be diluted before use).

Recommended dosage may be stated as no. of dl, pumps or caps, for example.

- Description of how the user avoids contact with the product, by using personal protective equipment, for instance.

The information text on the packaging/product data sheet must comply with the EU's regulation on the declaration of contents (Regulation (EC) No 648/2004, Appendix VII).

The product's area of use must match the area of use for which the product was tested.

If, after use, the product is considered environmentally harmful waste (like brush cleaner, for example), the label must state that the product should be disposed of as environmentally harmful waste.

✉ Technical description, safety data sheet, product sheet and label showing the information text.

6.6 Quality and regulatory requirements

The following procedures must be implemented to ensure that Nordic Ecolabelling's requirements are fulfilled. It is necessary for Nordic Ecolabelling to know, at all times, who the licensee's contact person is for the Nordic Swan Ecolabel. The applicant must therefore appoint a person who is responsible for ensuring constant compliance with the requirements applicable to the Nordic Swan Ecolabelled products. The contact person is also responsible for communication with Nordic Ecolabelling.

If the company has an environmental management system that is certified to ISO 14 001 or EMAS and the following procedures are applied, it is sufficient if the accredited auditor certifies compliance with the requirements.

The requirements ensure that the holder of the Nordic Swan Ecolabelling licence is responsible for health and safety, environmental legislation and installation-specific terms/permits at the production facility for the Nordic Swan Ecolabelled product.

Changes to the ecolabelled production process may have repercussions for the Nordic Swan Ecolabel licence. A written report of all changes that may relate to the

requirements set for the ecolabelled product must therefore be submitted to Nordic Ecolabelling. This will enable Nordic Ecolabelling to provide information on what needs to be done to ensure that the change does not impact on the licence.

In the event of unforeseen non-conformities, Nordic Ecolabelling can assess the consequences of the non-conformity and provide advice on what action the licensee should take.

Requirement text:

O18 Licence administrators

The company shall appoint an individual responsible for ensuring the fulfilment of the Nordic Ecolabelling requirements, and a contact person for communications with Nordic Ecolabelling.

✉ Organisational chart showing who is responsible for the above.

O19 Documentation

The licensee must be able to present a copy of the application and factual and calculation data supporting the documents submitted with the application (including test reports, documents from suppliers and suchlike).

🔑 On-site inspection.

O20 Quality of the industrial cleaning agent

The licensee must guarantee that the quality of the production of the Nordic Swan Ecolabelled industrial cleaning and/or degreasing agent is maintained throughout the validity period of the licence.

✉ Procedures for collating and, where necessary, dealing with claims and complaints regarding the quality of the Nordic Swan Ecolabelled industrial cleaning and degreasing agents.

O21 Planned changes

Written notice of planned product and marketing changes that affect the Nordic Ecolabelling requirements must be given to Nordic Ecolabelling.

✉ Procedures detailing how planned changes are dealt with.

O22 Unforeseen non-conformities

Unforeseen non-conformities that affect the Nordic Ecolabelling requirements must be reported to Nordic Ecolabelling in writing and logged.

✉ Procedures detailing how unforeseen non-conformities are handled.

O23 Traceability

The licensee must have documented traceability for the production of the Nordic Swan Ecolabelled product.

✉ Description of / procedures for fulfilment of the requirement.

O24 Take-back system

The Nordic Ecolabelling's Criteria Group decided on the 9 October 2017 to remove this requirement.

O25 Laws and regulations

The licensee must ensure compliance with the applicable legislation on health and safety, environmental legislation and installation-specific terms/permits at all the production sites for the Nordic Swan Ecolabelled product.

Documentation is not required. However, Nordic Ecolabelling may revoke the licence if the requirement is not fulfilled.

7 Changes compared to previous version

Comparison of requirements for industrial cleaning and degreasing agents in version 2 of the criteria and in version 3. The product group definition has been expanded to also include products for outdoor use.

Req. version 3	Req. version 2	Same req.	Changed	New req.	Version 3
O1			x		Information about the product
O2	R1		x		Classification of the product Requirement adjusted to bring it in line with the CLP Regulation
O3	R1, R3		x		Classification of constituent substances in the product. NTA requirement is no longer a separate requirement, but now falls under the requirement concerning classification of constituent substances (Carc. 2 H351). Requirement tightened regarding substances classified as Resp. Sens. 1 and Skin Sens. 1 that may not be used in the product, with the exception of preservatives and enzymes.
O4	R2		x		Environmentally harmful substances Tightening of requirement, new format.
O5	R11, R12, R13	x			Preservatives. The wording regarding the Challenge Test has been amended.
O6	R14	x			Dyes
O7	R9		x		Volatile organic compounds (VOC) New VOC definition, changed requirement concerning solvent-based products and other products.
O8	R7		x		Phosphorus and phosphonates - Not permitted in products for outdoor use, with the exception of products for ships and offshore. - Tightening of requirements concerning content of phosphorus. The requirement limit is the same for all types of products, including RTU.

Req. version 3	Req. version 2	Same req.	Changed	New req.	Version 3
O9	R4, R5, R8, R9, R10, R14, R15		x		Substances that must not be present in the product. Tightening of requirement: - aromatic solvents - Quaternary ammonium compounds that are not degradable and benzalkonium chloride - Candidate List - PBT and vPvB - nanoparticles
O10	R3		x		Surfactants, degradability OECD 306 added
O11	R16, R17	x			Aerobic degradability, aNBO Anaerobic degradability, anNBO
O12				x	CDV Critical Dilution Volume
O13	R18		x		User reports
O14	R19		x		Specifications of laboratory test for the performance test
O15	R20		x		PVC in packaging and other halogenated plastics
O16	R21		x		Labelling of packaging
O17	R22	x			Information for users
O18	R23	x			Licence administrators
O19	R24	x			Documentation
O20	R25	x			Quality of the cleaning agent
O21	R26	x			Planned changes
O22	R27	x			Unforeseen non-conformities
O23	R28	x			Traceability
O24	R29	x			Take-back system
O25	R30	x			Laws and regulations

8 New criteria

In future criteria (next revision), the following points should be reviewed:

- CDV requirement
- VOC requirement
- Requirements regarding preservatives
- Requirements regarding raw material production
- Possibility of setting differentiated requirements for environmentally harmful substances
- Possibility of strengthening the requirement concerning information on use of the product
- Possibility of expanding the product group to include cleaning systems.

Terms and definitions

Term	Explanation or definition
aNBO	Aerobically non-biodegradable substances
anNBO	Anaerobically non-biodegradable substances
BCF	Bioconcentration factor
CDV	Critical Dilution Volume
CMR	Substances classified as either Carcinogenic, germ stem Mutagenic or Reprotoxic
PBT / vPvB	Persistent, Bioaccumulative, Toxic/very Persistent and very Bioaccumulative
SVHC	Substances of Very High Concern
VAH	Volatile Aromatic Compounds, which are a subset of VOC
VOC	Volatile Organic Compounds
DID list	Detergents Ingredients Database list, dated 2014

Appendix 1 MECO matrix for industrial cleaning and degreasing agents

	Raw material phase	Production phase	Use phase	Waste phase	Transport phase
Material	Extraction of raw materials (chemical raw materials and packaging raw materials (plastic)) from petrochemical raw materials (oil/gas) Cultivation, harvesting and refining of bio-based raw materials (palm oil).	Production of end product and packaging.	Equipment for dosing and applying the products. May cause overdosing, user exposure to the products and undesirable emissions.	Packaging for incineration or recycling.	Shipping pallets, plastic wrap or cardboard.
Energy	Primary fossil energy consumption. Energy consumption in extraction/cultivation, refining and production of raw materials and packaging.	Energy consumption during production of end product and packaging.	Equipment for applying products. Products that require heated water.	Energy from incinerating packaging. Energy for water treatment plant.	Transport of raw materials and finished product. Ready-diluted products lead to greater energy consumption during transport.
Chemicals and emissions	Additives, plasticisers and other chemical treatment relating to raw material production. Emissions of CO_2 and SO_2. Potential emissions from extraction and production of raw materials.	Handling of chemicals in production. Risk of exposure. Potential emissions from production (cleaning tanks and risk of undesirable emissions). CO_2 emissions. Use of chemicals, for example additives in plastic production.	Risk of exposure during use. Emissions to water and air. Dirt and oil that the cleaning agents carry with them into the water recipient.	Packaging and residues of product. Large-scale emissions, either to a water treatment plant or directly to the water recipient, carry a risk to the environment if the products contain toxic or non-biodegradable substances.*	Transport, emissions of NO_x, CO_2, VOC.
Other	Working environment and employment rights at plantations and in the petrochemical industry. Impact on nature from extraction of raw materials. Risk of net emissions of CO_2 from deforestation and loss of biodiversity.	Working environment.	Performance and dosing. Allergies, VOC, working environment for professional products.		

** Could also be considered part of the use phase.*