

Swan-labelled

Floor care products

Draft Version 6

Background to ecolabelling

13/2-06



Nordic Ecolabelling

Swan-labelled Floor care products - Background to ecolabelling

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Summary

The criteria for floor care products have been revised for version 3. The criteria are still constructed in accordance with the same principles for criteria development. They are based on the life cycle perspective for the products together with an assessment of the relevance, potential and manageability of the requirements. In version 3 of the criteria, polish removers/wax removers have been incorporated in the criteria, to allow for ecolabelling of all floor care. Polish removers/wax removers are now included as this will ensure that all floor care is more environmentally friendly. The criteria have been tightened up and specified in greater detail within the same areas for which requirements have previously been laid down. See also the section entitled "changes from previous version" in this document.

Basic facts about the criteria

Products that can be labelled

Floor care products are in this context taken to mean products that apply a film of polymers to wax on floors to ease maintenance and protect the floor.

The product group includes base coat polish, floor polish, wash polish and wash-and-wax care products.

In version 3 of the criteria, we have included polish removers/wax removers, so that the entire floor care product series can now be ecolabelled.

Products that only have cleaning properties (e.g. non-wax wash care products) and products in which film formation takes place as a reaction between fatty acids and lime are not included in this product group.

Both products for professional users and products for ordinary users are included in the criteria for floor care products.

Constituents in base coat polish, floor polish, wash polish and wash care products are as follows:

- *Polymers* are the most important components in the film formed by the floor polish. Polymers are also incorporated in

wash polish. The polymer often contains zinc, which cross-binds the polymers. The monomer is mostly acrylic acid and acrylates together with, for example, styrene.

- *Wax* is incorporated in floor care products, partly to soften the polymer film and make it elastic. Polyethylene or polyester waxes are normal.
- *Plasticisers* are added to soften the polymer film. In the past dibutyl phthalate (DBP) was normal, but this is now largely replaced by tributoxyethyl phosphate (TBEP) or other plasticisers.
- *Resin* in the polish contributes to gloss and improves the flow properties as well as helping improve polish removal properties. Example: styrene-maleic acid resin or acrylate polymer.
- *Surfactants* are the name of a large group of surface-active substances. The primary function of surfactants in floor polish is as an emulsifier and wetting agent. Fatty alcohol ethoxylates and alkylether sulphates are often present. The primary function of surfactants in wash care products and wash wax is to loosen dirt and grease from the underlay and keep it dissolved in the wash water.
- *Solvents* used are water-soluble and have a film-forming effect. They also regulate the drying time of the floor care product. The main group of solvents comprises glycol ethers, such as diethylene glycol monoethyl ether (ethyl diglycol).
- *Preservatives* are added to give the product desired stability.
- *Perfume* is added on aesthetic grounds. Polishes are often unperfumed, while wash polishes can contain perfume.
- *Colouring agents* are added on aesthetic grounds and for identification. Polishes are normally uncoloured, while wash polishes often contain colouring agent.
- *Complexing agents*, such as EDTA, NTA and phosphonates, may be present in small amounts to bind impurities in the product, and ions such as Ca^{2+} and Mg^{2+} in hard water.

- *Ammonia* dissolves resin and forms complexes with zinc that make the polymer resistant to detergents and extend the useful life of the polish through increased abrasion resistance (hardness).

Polish products, which are intended for the professional market, have an active content of 18 – 35%, while wash polish and wash care products have an active content of 10 – 20%. The active content for consumer products is in the range 10 – 20%. The term 'active content' should be understood to mean the product's total content of constituent components minus water. The content of active components is optimised in terms of function and practical dosage.

Constituents in polish removers and wax removers are as follows:

- *Glycol ethers* as an aid. Glycol ethers in removers are often more short-chained than glycol ethers in polish products.
- *Alcohols* such as solvents, e.g. isopropanol, phenoxyethanols, benzylalcohol (phenoxyethanols can also be used as preservatives)
- *Preservatives* may be necessary in weakly alkaline removers, but are unnecessary in alkaline removers. The use of preservatives in polish removers/wax removers is limited.
- *Corrosion inhibitors* may be present in polish removers/wax removers if the product contains NaOH. NaOH is a highly corrosive substance, and corrosion inhibitors therefore remain necessary.
- *Complexing agents* are used in polish removers/wax removers. Phosphates, polyacrylates, NTA, EDTA and phosphonates, among other things, are found in removers.
- In addition, the following substances may be present in polish removers/wax removers: 2-methylpyrrolidone, fluorosurfactants, low-foaming surfactants, dispersants, e.g. acrylates.

Grounds for Swan labelling of floor care products, life cycle examination and arguments for laying down requirements for the Swan system.

One of the main aims of Nordic Ecolabelling is to help consumers choose the least environmentally polluting products or systems.

A qualitative assessment of the environmental and health burdens associated with floor care products, based on a life cycle perspective, from the raw material production stage to the waste stage, has been conducted. You can find out more on this under "Motivation of the requirements".

Version and validity of the criteria

The first generation of criteria for ecolabelling of film-forming floor care products was adopted on 12 December 1996. Criteria version 1 was revised in 2000, and the second generation of the criteria was adopted on 14 December 2000. From version 1 to version 2, it was mainly the functional test that was changed, although requirements concerning surfactants were also tightened up so that surfactants must be anaerobically degradable.

The following amendments of criteria version 2 were then undertaken:

- On 9 October 2003, the criteria were extended by 2 years to 11 December 2006 and VNF requirements for wash polish/wash care products were revised
- On 15 December 2003, requirements concerning perfume for wash polish/wash care products were added
- On 8 March 2004, adjustments were made to Environmentally harmful components and plasticisers

The evaluation of the criteria for ecolabelling of film-forming products is from 16 June 2003. The conclusion of this evaluation was that there was no immediate need to revise the criteria.

Unlike the last evaluation, the evaluation of criteria version 2.3 from March 2005 sets the scene for a revision of the criteria in 2005.

The third generation of the criteria was adopted on XX 2006. The following changes were made from version 2 to 3: see under "Changes from the last version" in this document.

The Nordic market

Total turnover of floor care products in Denmark, Finland, Iceland, Norway and Sweden are estimated to be around 11,000 tonnes, breaking down as follows between the countries:

Country	Consumption (tonnes/year)	Comments
Denmark	4,500	Only professional products. Wash care products without wax are included in the statement
Finland	2,000	Professional and consumer products. Polish removers are included in the statement
Iceland	125	Professional and consumer products
Norway	1,200	Professional and consumer products
Sweden	3,000	Only professional products

In the case of the Swan scheme, the number of licences and registrations break down as follows:

Country	Licences	Registrations	Total
Denmark	5	9	14
Finland	4	9	13
Iceland	0	1	1
Norway	1	14	15
Sweden	14	5	19
Total	24	38	62

There are 4 applications ongoing in the Nordic region.

Since the evaluation in 2003, the number of licences has risen from 17 to 24, and the number of registrations has risen from 9 to 38. This shows that there is a certain interest in ecolabelled floor care products among manufacturers and consumers.

The Swan-labelled floor care products account for the following percentages of the market for floor care products:

Denmark: approx. 5% of the market

Finland: approx. 5% of the market

Iceland:

Norway: approx. 15% of the market

Sweden: approx. 30% of the market, equivalent to SEK 15 million

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The majority of the products are sold to the professional market, while a smaller proportion is sold to the consumer market.

Around 5-10% of sales of floor care products are accounted for by polish removers or wax removers.

Products for the professional market are typically sold direct from manufacturer to user.

Other labelling schemes

The Swedish ecolabelling scheme "Good Environmental Choice" has a general set of criteria for chemical technical products, for which floor care products can apply for licensing. In addition, the American organisation "Green Seal" introduced criteria for floor care products in November 2004, and recommends certain products on the American market.

About criteria development/the revision process

Aims of criteria development/the revision process

In the revision of the criteria from version 2 to 3, the focus was placed on the following points:

1. The definition of the product group must be extended. Where appropriate by including polish removers/wax removers or the entire floor care product system, including dosing system and alternative maintenance methods, ecolabelling must be carried out in accordance with these criteria.
2. It should be considered whether the product group must only cover floor care products that do not require polish remover.
3. The requirement concerning complexing agents must be investigated, if it can be changed.
4. Tightening-up of requirements concerning fluorosurfactants, plasticisers and NTA.
5. Tightening-up of requirements concerning preservatives, so formaldehyde and formaldehyde-cleaving products are banned.
6. Clarification of requirements concerning breakdown of high-molecular substances.
7. Check whether the requirement concerning perfume must be changed.
8. General review of requirements concerning effectiveness, including specifically whether the user test can be made simpler.

9. Investigate whether requirements must be introduced concerning DIN labelling of caps.

10. Generally examine the requirement formulations of the criteria document and check whether these can be made simpler and the criteria document can be made more clearly arranged.

About this criteria development/revision

The revision of the criteria from version 2 to 3 has proceeded as an internal project at Nordic Ecolabelling, without an expert group. Experts and licence holders have been contacted continuously during the revision period (see Annex 1). In addition, various reports and technical information have been read to improve understanding of trends in floor care products and their ingredients (see reference list).

The following individuals from Nordic Ecolabelling took part in the development of criteria:

Denmark: Karen Dahl Jensen (Project leader)

Sweden: Svante Sterner (Product group manager) and Ulf Eriksson (Product group manager)

Norway: Arne Godal (Product group manager)

Finland: Kirsi Auranmaa (Product group manager)

Motivation of the requirements

Overall motivation for requirements concerning floor care products. RPS and life cycle assessments

A qualitative, but not a quantitative, assessment of the environmental and health burdens associated with floor care products has been conducted, on the basis of a total assessment of the products, from raw material production to waste and transport. The assessment has been conducted on the basis of literature studies and the technical group's knowledge of the products, their constituents and production.

In order for a product to be capable of being ecolabelled, the environmental and health properties of the products, including packaging, must meet certain requirements. For ecolabelling to be effective, it is also important that there are differences between the products on the market, so that only the best products secure the ecolabel. This means that there must be potential for improvement

among most of the manufacturers. The parameters in respect of which requirements are laid down in this criteria document have been identified on the basis of information on the main environmental effects and potential for improvement. Table 1 illustrates on what types of environmental burdens the criteria are focussed. S means specific requirements, G means general requirements. The effectiveness of the products is particularly important in this document because high-quality polish reduces the need for removal of the polish. This results in reduced consumption of resources and lower emissions of environmentally harmful components.

Table 1. Environmental burdens of floor care products

The product:	Raw material extraction	Production	Use	Waste	Transport
Consumption of resources - materials - energy			S	S	G
Emissions into air, water, soil		G	S		
Working environment		G	S		
Health		G	S		
Product packaging	S	S		S	

S= Specific requirements, G = General requirements

The main environmental burdens for floor care products arise when the polish is removed and discharged into the waste water. The main health burdens arise from application of the product.

Raw material extraction

Production of the constituents and extraction/refining of the raw materials for the constituents probably accounts for a significant proportion of the environmental burden associated with the products.

Most constituents of the products are synthetic (from petroleum-based products) or originate from the further refining of substances from plants or animals. Extraction and refining of raw materials often takes place in distant countries. It can be very difficult to obtain information on resource consumption and emissions. It is

also difficult to obtain information on origin and production methods when there are a number of sales and production stages between extraction of raw materials and the end product. Manufacturers of floor care products have very little influence over the production of raw materials and constituents. The transport of raw materials can also form an important part of the environmental burden, in respect of which it is difficult to lay down requirements. This part of the life of the products is therefore very difficult to control for the Swan scheme. In addition, most floor care products contain relatively uniform groups of components and the total environmental burden associated with raw material extraction and production of the constituents will therefore probably vary slightly from one product to another. For these reasons, requirements have not been laid down concerning raw material extraction, refining and transport of the ingredients.

Production

Production of floor care products chiefly involves the various ingredients being mixed and generally has very little damaging effect on the environment. The procedure is in principle the same for most products on the market. Requirements concerning emissions into the air, water and soil are laid down by the authorities in connection with production licensing. In addition, requirements concerning the working environment and use/content of substances harmful to health in production are regulated by the authorities' requirements.

Waste and packaging

The packaging of the floor care products gives rise to resource consumption and emissions during production of the packaging. In addition, the transport of small quantities of floor care product per packaging unit will also be important for the overall environmental burden arising from the floor care product.

Consumption of resources (both energy and materials) depends on the usage characteristics and effectiveness of the floor care products. The useful life and usage characteristics of the products are therefore very important for the environmental burden arising from the products.

Use

Polish applied to a floor will result in emissions into the water either directly via treatment plants as a result of the polish gradually wearing off during cleaning and/or from the entire polish film being

removed with polish remover. Wash polish and wash care product contain both cleaning and polishing components and will result in emissions when the wash polish/wash care product is applied and when the polish/wax gradually wears off during cleaning.

Use of floor care products may, on the other hand, result in the floors becoming easier to clean and thus result in reduced consumption of resources in the form of detergents, working costs and energy. The polish will also protect the floor underlay and result in less wear and a longer service life. Two aspects are therefore very important when choosing floor care products: 1) the polish must be capable of being removed with a "normal" polish remover so that environmental harm from removal of the polish is minimised, 2) the polish should be of high quality, so that the consumption of resources on removal of the polish is minimised.

How environmentally harmful the products are determined by a number of parameters. Among the parameters to be assessed are acute toxicity in the aquatic environment, bioaccumulability and biodegradability (particularly in combination with toxicity and bioaccumulation) for all constituents in the floor care product.

In addition to emissions into water or soil from environmentally harmful substances after use, floor care products may pose a danger of damage to health and/or the environment during the usage period and during the application phase. It is therefore important that constituents that evaporate have a low adverse effect on health and the environment.

In addition, it is important that the products do not contain components that result in health damage when the floor care products are used or applied. It is particularly the solvents that may cause health problems in connection with application of the products.

In order to establish the total health and environmental effects of a product, the constituents of the product must be assessed on the basis of the quantity actually used or needed to undertake a defined job. It is difficult to lay down a total functional dose for floor care products as different floor care products differ in their function and because the quantity of floor care products depends on the floor underlay, composition, the number of coats of polish, maintenance, etc. As a result of this, most requirements concerning the products' content of substances harmful to health and the environment in this

criteria document are related to the active content of the products, i.e. the product's total content of constituent components minus water. Although the active content of a product does not necessarily reflect the effectiveness of the product, this parameter is assumed to represent an indirect aim for the functional dose of the products.

Dose-related requirements mean that concentrated products do not experience unforeseen problems with meeting the requirements, compared with more diluted products. In addition, dose-related requirements mean that the environmental burden of the product is viewed in connection with the quantity of floor care product actually used/needed.

Polish removers/wax removers

Nordic Ecolabelling has received expressions of interest and inquiries concerning the possibility of also being able to use ecolabelling on polish removers/wax removers, in connection with the ecolabelling of floor care products.

Polish removers belong together with polish, and by extending the criteria to include polish removers/wax removers, we can increase the environmental control of the entire floor care process. Polish removers/wax removers have previously been deemed such environmentally harmful products that they could not be ecolabelled. In recent years, however, an improvement in polish removers/wax removers has taken place, and this gives Nordic Ecolabelling a reason to promote the removal products that are less harmful alternatives to other products. In this way, we ensure that a larger part of the "floor care" process takes place in an environmentally sound manner.

In the past, polish removers consisted mainly of butyl glycol, ammonia and metasilicate/lye and surfactants. The ammonia has now been replaced with an alkali MEA (monoethanolamine); glycol ethers are somewhat "milder" types, the alkali quantity is reduced and the solvent content is increased.

There are two different types of polish removers. Those that affect the polish film with organic solvents e.g. glycol ethers such as DEGBE (diethylene glycol monobutylether), EGBE (ethylene glycol butylether); EGPE (ethylene glycol monopropylether) (2-

phenoxyethanol) or benzyl alcohol, and those containing more or less alkali in combination with a lower level of organic solvents.

In addition to the above substances, polish removers also contain relatively small amounts of surfactant, hydrotropes (e.g. cumene/xylene sulphonate, phosphate esters), small amounts of EDTA (ethylenediaminetetraacetic acid), NTA (nitrilotriacetic acid) or MGDA (methyl glyoxal dimethyl acetal). Perfumes may also be present in polish removers. The pH of a concentrated polish remover is in the range 8-13.

The solvents may, in the case of environmentally friendly polish removers, be less bioaccumulable and less toxic for aquatic organisms.

How often a polish remover/wax remover is used depends to a large extent on which type of floor polish has been used and which maintenance method has been chosen for the floor. Generally, polish remover should be used as little as possible. This is due to the fact that scouring (= removal of polish from the floor surface with the aid of a scourer and a polish removal product) and the subsequent application of fresh polish is very expensive, and the floor material may be adversely affected by polish remover.

Motivation for the individual requirements

Product group definition

Nordic Ecolabelling has received expressions of interest and inquiries concerning the possibility of also being able to use ecolabelling on polish removers/wax removers, in connection with the ecolabelling of floor care products.

Polish removers belong together with polish, and by extending the criteria to include polish removers/wax removers, we can increase the environmental control of the entire floor care process. Polish removers/wax removers have previously been deemed such environmentally harmful products that they could not be eco-labelled. In recent years, however, an improvement in polish removers/wax removers has taken place, and this gives Nordic Ecolabelling a reason to promote the removal products that are less harmful alternatives to other products. In this way, we ensure that

a larger part of the "floor care" process takes place in an environmentally sound manner.

Another alternative proposed during the revision of the criteria for floor care products was completely stopping the ecolabelling of polish products that required polish removers/wax removers. The project group considers that Nordic Ecolabelling has a greater chance of ensuring the environmentally sound development of polish products and polish removers by continuing the possibility of ecolabelling of polish that requires remover, and supplementing this with requirements concerning the removal products.

There have been interested parties who want Nordic Ecolabelling to investigate the possibility of extending the product group for floor care products, so that it deals with the entire "service" of floor care. Thus, including the floor care product, the removal product as well as dosing plant and alternative maintenance methods. The project group has chosen only to add polish removers/wax removers and thus keep the criteria as criteria for products and not a service. This is due in particular to the large overlap that would exist between the criteria for cleaning services and a criteria document with floor care as a service. It would be confusing to have two criteria documents for services that overlap so much. The project group proposes instead that requirements for the floor care service in the criteria for cleaning services be examined instead.

Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products.

Information on formulation

It is important for Nordic Ecolabelling to have detailed knowledge of Swan-labelled floor care products. Without such knowledge, it is not possible to assess what criteria are relevant, and which requirements must be laid down for the product. Nordic Ecolabelling therefore wants information on the formulation of the floor care product.

Classification of the product

Nordic Ecolabelling endeavours to ensure that the health and environmental impact of the products should be as limited as possible. Requirements are therefore laid down that products labelled in terms of hazard in accordance with current regulations

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governing health, the environment, fire or explosion danger cannot be ecolabelled.

The classification applies in accordance with Substances Directive 67/548/EEC and Preparations Directive 1999/45/EC with later amendments and revisions.

As an exception, floor care products that are locally irritating (Xi) with risk phrases R36, R37 and R38 can be ecolabelled. This exemption has been granted to allow very concentrated products that will, among other things, reduce the environmental burden from transport and packaging.

This requirement means that a product labelled as environmentally harmful, very toxic, toxic, harmful to health, corrosive, irritating (only R41), allergenic, carcinogenic, harmful to reproduction or mutagenic cannot be ecolabelled.

Environmentally harmful substances

Substances that are highly degradable may cause problems now and in the future. The effects may become particularly serious if the substance is at the same time acutely toxic.

Requirements are therefore laid down stipulating that substances that meet the criteria for environmental harmfulness pursuant to EU Directive 67/548/EEC must not be included in the product in a concentration of more than 100 mg/g active content in total. This corresponds to 2% of a product that has an active content of the order of 20% (professional products). In the case of a product which has an active content of 10% (consumer products), the limit corresponds to 1%.

In this requirement, plasticisers (apart from phthalates) are exempted from the general requirement concerning environmentally harmful substances, and are allowed to be added in a limited amount. Plasticisers are a very important component in many floor care products.

Substances with a molecular weight of over 700, minimum calculated cutting of more than 9.5 Å or a length of more than 5.5 mm are in some cases included in this requirement if their toxicity is less than 100 mg/l. It is possible to perform a toxicity test on high-molecular substances in floor care products. High-molecular substances are generally considered not very bioavailable or degradable. The fact that high-molecular substances are exempted

from testing of degradability and bioaccumulability means that only if these have toxicity of less than 1 mg/l could they be classified in terms of environmental risk, and in this way be covered by the general requirements concerning environmentally classified substances.

High-molecular substances are very important constituents of floor care products, and so rigorous environmental requirements should be imposed on them. High-molecular substances that are toxic in concentrations of up to 100 mg/l will be classified in terms of environmental risk if it was possible to test for degradability, and these proved to be highly degradable. There is therefore a requirement that only high-molecular substances with toxicity of more than 100 mg/l are exempted from requirements concerning degradability and bioaccumulability.

Testing of toxicity must be performed on a minimum of one of the three trophic levels (fish, algae or daphnids).

It is not specified in the criteria which test method is to be used. This is due to the fact that a normal toxicity test cannot be performed on substances with a molecular weight of more than 700 because the substances are so large that they cannot pass through the cell membrane of the test organisms. If the high-molecular substance is soluble in water, a normal toxicity test can be performed.

The requirement has, however, been included without a specification of the test method because the project group has found that different forms of toxicity test have been performed on high-molecular substances. Such a toxicity test may create the impression that, however toxic high-molecular substances may be, what the product group considers is relevant for this product group.

Substances with a low boiling point and observance of administrative standards for solvents

When floor care product is applied, the readily volatile components of the products will evaporate relatively rapidly. Such high concentrations may arise that this poses a health risk to people applying the floor care product or who are in the same room for some other reason. Requirements are laid down to the effect that added solvents with a boiling point below 150°C must not be harmful to health.

This requirement means, among other things, that the following substances are excluded in floor care products: methyldiglycol, classified as Xn with R63 (Possible risk of harm to the unborn child) and Butylglycol, classified as Xn with R20/21/22 (Harmful by inhalation, in contact with skin and if swallowed).

Requirements are also imposed to the effect that administrative standards laid down by the authorities must not be breached when a floor care product is applied. Ecolabelling intends the term 'administrative standards' to mean the Danish limit values for air pollution, Finnish HTP values, Norwegian administrative standards for pollution in the work atmosphere and Swedish hygiene limit values. In cases where administrative standards vary in the Nordic countries, the lowest value applies ("Where the products are used normally, the administrative standards for solvents must not be breached in any Nordic country").

Most solvents are relatively polar and water-soluble. Smaller volatile solvents will therefore to a large extent remain in the product or evaporate off slowly. This requirement therefore covers only volatile solvents.

Requirements concerning constituent substances and breakdown products

The criteria must as a rule be designed so that unwanted components are excluded by virtue of their properties (e.g. toxicity, breakdown, environmental harmfulness, etc.). Certain components will, however, have special properties which mean that they are not covered by general requirements. Specific requirements must therefore be laid down for these components. This applies, for example, to components that have different environmental effects from those included in the health and environmental harmfulness criteria (e.g. APEO (alkylphenoethoxylates) which have a disruptive effect on hormones) or components that are so environmentally hazardous that they cannot be authorised by ecolabelling, even in quantities below the limit values for environmentally harmful components (e.g. bioaccumulating preservatives). A brief justification of the requirements laid down for constituent substances is set out below.

Ingredients classified as carcinogenic, mutagenic or reproduction-toxic

Requirements have been introduced to the effect that ingredients must not be classified as carcinogenic, mutagenic or reproduction-

toxic. Nor is it authorised to use ingredients that can cleave off substances classified as carcinogenic, mutagenic or reproduction-toxic. This requirement has been laid down because known substances in floor care products have the above harmful effects on health, and there are alternatives. Many of these substances, e.g. preservatives, are often added in such small amounts that their hazard classification would not entail classification of the entire product, and so this is not covered by the general requirement concerning classification of the product.

The above does not exclude the preservatives formaldehyde (Carc3) and Bronopol (cleaves off formaldehyde).

Halogenated and aromatic solvents

Halogenated and aromatic solvents result in a significant burden on health and the environment. Requirements have therefore been laid down to the effect that such solvents must not be present in the floor care product in concentrations above 0.010%.

Complexing agents

Many complexing agents have proved to be a problem for the environment, for various reasons. Examples of complexing agents that pose environmental and health problems are described below. The project group has, from examining licences and talking to manufacturers, found that floor care products can be made without the use of complexing agents. The project group wants to limit the quantity of chemicals that may be dispensed with in floor care products, and so in version 3 of the criteria a ban was imposed on the use of complexing agents in Swan-labelled floor care products.

EDTA (ethylenediaminetetraacetic acid) and phosphonates are complexing agents that are broken down only with difficulty in treatment plants or the receiver and are suspected of contributing to mobilisation and increased water transport of heavy metals. NTA (nitrilotriacetic acid) is a complexing agent classified as carcinogenic in class K3 (WHO). The authorities in the Nordic countries have various restrictions for NTA. See also the arguments in the section "Complexing agents (EDTA, DTPA, NTA) and phosphonates" under "Environmental requirements concerning polish removers and wax removers".

Plasticisers, phthalates

There are requirements whereby phthalates are not allowed in an ecolabelled product. Phthalates are a group of compounds that are especially harmful to health and the environment (toxic to aquatic organisms, and can cause harmful long-term effects) and for which there are alternatives.

Preservatives

Requirements are laid down to the effect that preservatives must not be capable of bioaccumulation. Preservatives classified as environmentally harmful will be covered by the required concerning environmentally harmful substances that limit the quantity of environmentally harmful components. The background to this additional requirement for preservatives is that, by virtue of their function, such substances are as a rule environmentally hazardous and highly degradable, and should be limited further. The more bioavailable a substance, the greater the harmful effect that it may have. Bioaccumulability is one of the main indicators for bioaccumulability.

The above excludes preservatives such as Triclosan (logKow = 4.76 and BCF = 2530) and butylparaben (logKow = 3.47)

Requirements are also laid down concerning the performance of a "Challenge test" to minimise the quantity of added preservative. The Challenge test is a generic designation for testing to determine the correct/necessary quantity of preservative in products. This is done by having a range of batches/samples with test product and then adding various concentrations of preservative. The samples are tested for growth of a range of bacteria, yeast fungi and mould fungi after 7 days. Inoculation is performed again with a mixture of bacteria, yeast and mould fungi and the samples are tested again for growth 7 days after inoculation. This continues for a minimum of 28 days (several tests require a minimum of 6 weeks). The lowest concentration of preservative at which growth does not occur is the correct/optimal quantity of preservative for the product.

The various manufacturers and suppliers of preservatives have different Challenge test/methods, which they use to determine the correct concentration of preservative. The tests include the following: Koko Test (test method SM 021), USP Challenge Test (US Pharmacopoeia) and CTFA Challenge Test (Cosmetic Toiletries and Fragrance Association).

Perfumes

Perfumes can be highly degradable, bioaccumulating or allergenic. As perfumes have no function in the floor care product, perfume is not allowed in floor care products, apart from wash polish/wash care products. In the case of wash polish/wash care products, it is not authorised to use perfume substances with nitromusk compounds as these are carcinogenic. Nor is it authorised to use the 26 perfume substances known to be allergenic.

Colouring agents

Colouring agents are added on aesthetic grounds, while some claim that added colour makes it easier to dose correctly. There are few studies describing the health and environmental properties of colouring agents. In general, colouring agents in floor care products are considered to be unnecessary additives. Requirements are therefore laid down that colouring agents must not be added.

Monomers

Residual monomers in the polymer may result in a burden on health, partly owing to their allergenic and carcinogenic properties. This burden is considered so great that a specific requirement needs to be imposed to limit the total content of monomers in the polymer. The requirement is laid down as 50 mg/kg newly produced polymer.

The quantity of monomer is probably much lower when the product is used by the customer because many monomers are volatile compounds. The requirement is related to newly produced polymer because it is important to reduce the problem at source and because it is more practical for the polymer manufacturer to perform the analysis.

Ingredient emulsifiers

Ingredient emulsifiers are surfactants whose purpose is to keep wax and the like in emulsion = "dissolved" in the products.

Ingredient emulsifiers are chosen on the basis of what they must emulsify. The purpose of the emulsifiers is to make very stable solutions in concentrated solutions; as soon as they are diluted and

applied, however, they will seek the water/air margin, and thus release the phase that they emulsify – in this case, typically wax.

Many different types of ingredient emulsifiers are used – from conventional alcohol ethoxylates to silicone-based and fluorine-based emulsifiers – are used. Some manufacturers still use nonylethoxylates. The quantity of emulsifiers depends on many aspects, and can range from a few per cent to more than 25%.

A number of emulsifiers will be biodegradable – perhaps not within 28 days owing to their molar weight (they are typically highly ethoxylated to make them more water-soluble and stable – steric stability increases with an increasing quantity of ethylene oxide). It is not, however, absolutely clear which emulsifiers are anaerobically biodegradable. Some will be, whereas others will find it very difficult to meet this requirement.

Depending on which floor care product is involved, there are various ingredient emulsifiers that work. In the case of some floor care products, it may be that only emulsifiers that are not both aerobically and anaerobically degradable can be used for the product to work. The project group has therefore introduced the exception that ingredient emulsifiers that are not readily degradable or anaerobically degradable can be used, but only up to 10 mg/g active content (equivalent to 1% of the active content).

APEO and LAS

APEO and LAS must not be added to the product. The ban on APEO is due to the fact that a number of these substances are suspected of having a disruptive effect on hormones, and that the authorities in the Nordic countries prioritise a reduction in the consumption of these substances. LAS form a group of compounds with low anaerobic degradability. The ban is motivated in part by the finding in Denmark of undegraded LAS in sewage treatment plant sludge that was to be used for agricultural purposes.

Surfactants, aerobic degradability and anaerobic degradability

The requirement concerning the biodegradability of surfactants is standard at Nordic Ecolabelling, and is imposed in order to ensure that the use of surfactants is important from an environmental point of view. According to the report from DHI entitled "Anaerobic

biodegradability of surfactants" dated September 2002 (source 5), the importance of anaerobic degradability of surfactants is emphasised. Surfactants that are not readily degradable and non-anaerobically degradable surfactants may build up in waste sludge, sludge-improved soil and sediment in lakes and watercourses and affect organisms adversely. Surfactants are bipolar and, by virtue of this, have a toxic effect in all aquatic environments.

Requirements are therefore laid down so that all surfactants used must be aerobically degradable and anaerobically degradable.

However, exceptions for fluorosurfactants, silicone surfactants and ingredient emulsifiers are authorised. These are not added to floor care products for cleaning purposes, but to give the floor cleaning product certain other functions. Other requirements are laid down for these substances, see above.

It should be pointed out that all floor care products with a cleaning effect are subject to the Detergents Order, which requires aerobic degradability of the surfactants in these products. Floor care products, which do not form a direct part of the cleaning process but which are only intended to put a protective layer on the surface, are, however, not included in the Detergents Order (source 4). The project group has therefore considered it relevant to lay down rules concerning both aerobic and anaerobic degradability for the surfactants in floor care products.

Fluorosurfactants and silicone surfactants (source 1 and 2)

Level of consumption

Fluorinated surfactants are used in floor care products to increase the flow capacity of the product without adversely affecting the polish film. The use of fluorinated products in floor polish products is very high. In Denmark, polish products account for up to 9% of total consumption of POFS-related substances listed in the Danish Product Register. (POFS = Perfluorooctane sulphonate). In Sweden, this figure is up to 6%.

In Sweden, the concentration of fluorosurfactants broken down into PFOS is 0.005-0.01% in prepared floor care products. For Norway, the concentration is generally less than 0.01%, while in Denmark it is in the range 0.06-0.1%.

Environmental and health problems with fluorosurfactants

Fluorosurfactants (with fluorinated carbon chains over 6) are broken down into the highly stable PFOS and PFOA (Perfluorooctanoic acid) and similar related substances. These substances are found throughout the globe, from the large oceans to the arctic regions.

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PFOS is found in, among other things, birds and fish and in their eggs. PFOS and related substances are readily absorbed in the body and are bound to proteins, leading to an accumulation in, for example, blood and the liver. The half life of these substances is several years in the body, and experiments have shown that they have a disruptive effect on hormones. In addition, PFOA and PFOS have induced cancer in experimental animals.

Alternatives to fluorine-based surfactants in floor polish:

In the case of floor polish products, it is not easy to find alternatives to fluorine-based products that maintain a satisfactory polish result. Many trials have been performed, including with acrylates, but the result has not been satisfactory.

Nordic Ecolabelling has also received information on successful trials involving the replacement of fluorosurfactants with silicone surfactants. There are, however, also environmental problems with silicone surfactants as the siloxane part is highly degradable, and the product is assigned the environmental hazard rating of R51/53 (Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment). It is therefore not self-evident that there is an environmental benefit from replacing fluorosurfactants with silicone surfactants. At the same time, however, it cannot be definitely stated that silicone surfactants are worse than fluorosurfactants, which is why the project group has chosen to place the two types of surfactants on the same footing.

Another alternative is to use fluorine-containing substances with short fluorinated carbon chains (C chains of 5 and less). These short fluorinated carbon chains mean that the breakdown product does not become PFOS or PFOA, which is the case with fluorosurfactants with longer fluorinated carbon chains (upwards of 6). There is, however, still little information on the environmental and health impact of substances with shorter fluorinated carbon chains. The few studies that have been conducted indicate that they are less toxic and less bioaccumulable. However, these short-chain fluorosurfactants will still leave some highly degradable fluorine-containing breakdown products.

In the case of products that have both a washing effect and a floor care effect, it is possible to replace the fluorosurfactants with non-ionic and anionic surfactants.

Requirements concerning fluorosurfactants and silicone surfactants

With requirements concerning aerobic and anaerobic degradability of all surfactants, the project group exclusively has fluorosurfactants and silicone surfactants in floor care products. This is due to the above-mentioned environmental and health problems associated with fluorosurfactants and silicone surfactants.

The project group has, however, also considered an alternative to the exclusion of fluorosurfactants as we fully appreciate that it is very difficult to replace fluorosurfactants in polish products. The alternative was as follows: to ban fluorosurfactants in wash polish and wash care products.

Only allowing fluorosurfactants in polish in a concentration of 0.010% of the product, and requiring the fluorosurfactants added not to have a fluorinated carbon chain of more than 5 C atoms.

Surfactants, critical dilution volume

Requirements are laid down concerning critical dilution volume (CDV) for surfactants in wash polish and wash care product. CDV is a measure of the environmental burden of the ingredients on the aquatic environment. CDV is calculated from the quantity of ingredients in the wash care product/wash polish per litre of usage solution and the toxicity and biodegradability of the ingredients. Toxicity data and degradability data are taken as far as possible from the DID list (Detergent Ingredients Database), in which the toxicity value is combined with a safety factor that gives an impression of how secure the toxicity data are. The limit value for CDV has been put at 6500.

The intention of the requirement is to reduce the toxicity burden of surfactants on aquatic environments.

High-molecular substances must not be included in the calculation of CDV. You can read more about these under "Environmentally harmful substances" above.

Environmental requirements concerning polish removers and wax removers

Information on formulation

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See the section "Information on formulation" under "Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products".

Classification of the product

See section "Classification of the product" under "Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products".

Environmentally harmful substances

Substances that are highly degradable may cause problems now and in the future. The effects can be particularly serious if the substances are acutely toxic at the same time.

One Finnish manufacturer of polish remover/wax remover has stated that environmental requirements concerning polish remover/wax remover could be based on certain requirements from the criteria for industrial degreasing. The project group has therefore, as a first step on requirements for polish remover/wax remover, chosen to adopt the same level.

Substances with a low boiling point

When polish remover or wax remover is applied, the readily volatile components in the products will evaporate relatively rapidly. Such high concentrations may arise as to pose a health risk to people who apply the floor care product or who are present in the same room for some other reason. Requirements are therefore laid down that added solvents with a boiling point below 150°C must not be harmful to health.

Ingredients classified as carcinogenic, mutagenic or reproduction-toxic

Requirements have been introduced to the effect that ingredients must not be classified as carcinogenic, mutagenic or reproduction-toxic. Nor is it authorised to use ingredients that can cleave off substances classified as carcinogenic, mutagenic or reproduction-toxic. The requirement has been imposed because known substances in floor care products have the above health effects, and alternatives exist. Many of these substances, e.g. preservatives, are often added in such small amounts that applying a hazard

classification to them would result in classification of the entire product, which is why it is not included in the general requirement concerning classification of the product.

The above excludes the preservatives formaldehyde (Carc3) and Bronopol (cleaves off formaldehyde).

Complexing agents (EDTA, DTPA and NTA, phosphonates and phosphorus)

Many complexing agents have proven to be a problem for the environment, for various reasons. Examples of complexing agents that pose environmental and health problems are described below. The project group wants to limit the quantity of chemicals that can be dispensed with in polish removers/wax removers, and a ban has therefore been imposed on the use of complexing agents in Swan-labelled floor care products. Nevertheless, the following exceptions apply:

Citrate may be added. NTA may be added in concentrations below 0.10% in the product. Phosphorus may be added in concentrations below 1.0%.

EDTA (ethylenediaminetetraacetate) and DTPA (diethylenetriaminepentaacetate) are excluded as far as possible at Nordic Ecolabelling. This is primarily due to the fact that EDTA and DTPA are substances that can mobilise heavy metals in the environment and that EDTA and DTPA are highly degradable. There are considered to be sufficient alternatives to EDTA and DTPA.

NTA (nitrilotriacetic acid) is on IRAC's (the International Agency for Research on Cancer, the WHO cancer research centre) and the Danish Supervisory Agency's list of carcinogenic substances (source 6), which is why Nordic Ecolabelling wants as far as possible to exclude NTA in ecolabelled products. It has been chosen to authorise a small quantity of NTA (max. 0.10%) in the concentrated product as many of the alternative complexing agents to EDTA and DTPA may contain a relatively small amount of NTA, typically < 1%. The level of 0.10% NTA in the concentrated cleaning product has been laid down with due regard for the Danish rules on the labelling of products as carcinogenic. Another reason for authorising 0.10% NTA in the concentrated product is that on environmental grounds we want to exclude the use of EDTA and DTPA. At the present time, however, there are thought to be relatively few alternatives to EDTA

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and DTPA, which is why many of them contain a small amount of NTA.

Phosphonates are highly degradable complexing agents. They are very toxic to algae and can increase the water solubility of heavy metals and thus their toxicity. Phosphonates can be present in polish removers/wax removers, but there are alternatives. The project group has therefore chosen that phosphonates should not be present in polish removers/wax removers.

Phosphates are, besides being complexing agents, also nutrients in the receiver, which may lead to eutrophication and thus the loss of oxygen from lakes and watercourses. Nordic Ecolabelling therefore wants to limit the use of phosphorus. Waste water from floor polish removers/wax removers will usually pass through a treatment plant, where a large part of the phosphorus is collected when it reaches the receiver. The requirement concerning the phosphorus content of polish removers/wax removers has therefore become max. 1% by weight of phosphorus in the product.

Citrate also functions as a complexing agent in certain products. There are known environmental problems associated with citrate, and this is therefore authorised as a complexing agent.

Plasticisers, phthalates

See the section "plasticisers, phthalates" under "Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products".

Preservatives

See the section "Preservatives" under "Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products".

Perfumes

Perfumes can be highly degradable, bioaccumulating or allergenic. As perfume does not have any function in polish removers/wax removers, perfume is not authorised.

Colouring agents

See the section "colouring agents" under "Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products".

APEO and LAS

See the section "APEO and LAS" under "Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products".

Surfactants, aerobic degradability and anaerobic degradability

See the section "Surfactants, aerobic degradability and anaerobic degradability" under "Environmental requirements concerning base coat polish, floor polish, wash polish and wash care products".

Requirements concerning packaging

Chlorinated plastic and labelling of packaging

Requirements are laid down to the effect that the packaging must not contain PVC or other chlorinated plastic types. The reason for the requirement is that the production and burning of chlorinated plastic can result in emissions of environmentally harmful substances. In addition, PVC creates problems with disposal, during both incineration and dumping. PVC should be separated from other waste, but this takes place on a very low scale in Europe. In addition, PVC is an extremely stable type of plastic which is not optimal for use as packaging for products with a short useful life. There are other materials for packaging that form adequate substitutes to chlorinated plastic, and which are not subject to corresponding environmental problems.

This requires labelling of packaging in accordance with ISO 11 469 or an equivalent labelling system to ease source grading of the materials.

The labelling requirement does not apply to caps and pumps. It is not currently normal for pumps and caps to be labelled, and it is very difficult to get these labelled. This may consequently mean a disproportionate increase in packaging expenses relative to the environmental effect achieved by labelling pumps and caps.

Weight-benefit relationship

The consumption of packaging per gram of active content decreases with increasing concentration and size of the product unit.

Requirements are therefore laid down concerning the weight-benefit relationship (WBR) of the products, which means that the weight of the packaging relative to the product's content of active components must not exceed a given limit. The requirement helps reduce the energy requirement associated with the transport and quantity of packaging (and thus reduce resource consumption and emissions). The requirement concerning the weight-benefit relationship also promotes the use of recirculated material as unrecirculated packaging components are weighted compared with recirculated ones. This helps cut the total material requirement and helps increase the level of recirculation of packaging materials.

X (requirement level for VNF) is 5 times lower for professional products than for consumer products. Ordinary consumers have a significantly lower consumption than professional users. The products have a limited useful life, and it is therefore natural that products for the professional market are sold in larger packs than consumer products. The greater the content of the product, the lower will be the quantity of packaging product per product unit. If only one limit value had been imposed, the consumer products would have problems with the requirement, while the professional products would easily meet the requirement. The aim for the criteria is for as many manufacturers as possible to reduce packaging consumption. It is therefore natural to impose different requirements on professional and consumer products.

The limit value for the weight/benefit relationship for professional products has been laid down on the basis of a survey of 6 manufacturers of floor polish for the professional market. In laying down the limit value for consumer products, use has been made of information from a single manufacturer of floor care products and information on packaging consumption for 5 universal cleaning products, which has a great deal in common with consumer products for floor care. In the calculations for consumer products, it has been assumed that the products have an active content of approx. 10%.

The requirement has not been amended in connection with the revision as information from the licence holder has shown that the level of requirements was still relevant.

Requirements concerning effectiveness

It is not enough for ecolabelled products to satisfy requirements concerning environmental pollution. The products must also have satisfactory effectiveness.

In drawing up previous criteria proposals, considerable work was put into determining which tests should be conducted to document the effectiveness of a product. The following test descriptions have been studied:

ASTM tests

RAL-TG

Federal Specification

Qualitätsnormen für Fussbodenpflege- und reinigungsmittel

Internal testing at manufacturers of floor care products

The test statement in Annex 6 to the criteria document is a result of the work on formulating requirements for the effectiveness test. Importance has been attached to the products being tested in practice as products of this type cannot be developed without field testing/experience from practical use.

Requirements concerning heel marking, dirt absorption have been removed from the laboratory tests. These parameters are included in the field test.

In the case of consumer products, requirements have been introduced concerning the performance of laboratory tests to determine the water resistance, slip resistance and removal of the products. Requirements for the performance of field testing have also been included.

There is also a function test for wash-and-wax care products.

The user reports have been specified further in this criteria document, and testing for polish removers/wax removers has been introduced. In addition, the test period for user testing has been reduced from 6 months to 3 months as a number of licence holders have indicated that the performance of user testing was very difficult when the test period was so long.

Information for users

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To enable users to gain access to information on the composition of the product, requirements are laid down stipulating that the products must have information text in accordance with the EU's "Recommendation for the labelling of detergents and cleaning products" (89/542/EEC). In the case of professional products, this information can be given in the data sheet of the products.

To avoid overdosing, requirements are laid down stipulating that dosage intervals must be indicated for the product. A requirement is also introduced concerning dosage instructions for consumer products.

Quality and official requirements and marketing

Official requirements concerning safety, the working environment and the external environment

The requirement is laid down to ensure that the ecolabelling licence holder meets licensing requirements concerning safety, the working environment and the external environment. This is standard at Nordic Ecolabelling.

Recycling system for the product and packaging

This requirement is standard at Nordic Ecolabelling.

Environment and quality control

Requirements concerning environmental and quality control are laid down to ensure that satisfactory control of production of their eco-labelled products and the ecolabelling requirements are met during the period of validity of the licence. This is standard at Nordic Ecolabelling.

Marketing

No change in requirements concerning marketing.

Requirements concerning marketing are laid down to ensure that relevant individuals in the enterprise are acquainted with the rules that apply to the marketing of ecolabelled products. These requirements are standard at Nordic Ecolabelling.

Changes from previous version

From version 2 to the consultation on version 3, the following changes have been made:

The criteria document has been drawn up in a new template and the formulation of the requirements has been reviewed, which has made the criteria easier to grasp and read.

The requirement concerning complexing agents has been tightened up so that their use is not authorised in base coat polish, floor polish, wash polish and wash care products.

Ingredients in base coat polish, floor polish, wash polish and wash care products must not be or cleave off substances classified as carcinogenic, mutagenic or reproduction-toxic.

The limit for the concentration of monomers in newly produced polymer dispersion for base coat polish, floor polish, wash polish and wash care products has been reduced from 1 mg/g polymer to 50 mg/kg polymer.

Requirements concerning high-molecular substances in base coat polish, floor polish, wash polish and wash care products with aquatic toxicity of less than 100 mg/l have been included in the requirement for environmentally harmful substances.

The authorised quantity of ingredient emulsifiers in base coat polish, floor polish, wash polish and wash care products that are not readily degradable and anaerobically degradable has been reduced from 50 mg/g active substance to 10 mg/g active content.

A ban has been introduced on the use of fluorosurfactants and silicone surfactants in base coat polish, floor polish, wash polish and wash care products as all surfactants must meet the requirement for aerobic or anaerobic degradability.

The requirement concerning critical dilution volume has been changed so that it now involves information on the surfactants obtained in the DID list, resulting in a change in the requirement limit.

Polish removers/wax removers have been introduced in the criteria with their own environmental requirements and effectiveness requirements for them.

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The frameworks for user testing have been extended.

Examples of what the changes may do for the environment:

Fluorosurfactants: If all floor care products in the Nordic region met the Swan requirements, which now entail a ban on fluorosurfactants, this would save the environment 6.6 tonnes of fluorosurfactants broken down into PFOS per annum in the Nordic region. (Assumption: Consumption of floor care products per annum is 11,000 tonnes and the content of fluorosurfactants broken down into PFOS in floor care products are on average 0.06%).

Polish removers: If all polish removers in the Nordic region met the Swan requirements concerning classification of products, we would save the environment and people 309 tonnes of products which were classified in terms of hazard in one way or another. (Assumption 7.5% of floor care products on the market are polish removers/wax removers = 825 tonnes, and 3 out of 8 polish removers/wax removers are classified in terms of hazard).

New criteria

During a future revision, further attention will be paid to:

- The possibility of completely banning fluorosurfactants and alternatives to fluorosurfactants that have also proven to be highly degradable and harmful to the environment and health.
- The possibility of banning perfume in floor care products
- Tightening up the requirements for polish removers and wax removers

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Annex 1 List of experts and licence holders who have been involved in the revision of the criteria.

Country	Name of expert	Expert affiliation
Denmark	Anders Reckweg	BASF
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	Kristian Köcher	Ecolab
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	Silje Bjørlykke	Lilleborg Profesjonell
Finland	Heidi Kähkönen	Kiilto Oy
	Tuija Salo	Farmos
	Johanna Sumelius	Johnson Diversey
	Riitta Leinonen	Finlands Miljöcentral
Sweden	Göran Schulz	Johnson Diversey
	Örjan Carlsson	Nilfisk-Advance
	Kåre Kilgren	HTC Sweden
	Ulrika Flodberg	IIH Trade Association
	Peter Nohrstedt	EKU Swedish Environmental Control Board