About Nordic Ecolabelled

# Supplies for microfibre based cleaning

**Version 2.9**

**Background to ecolabelling**

Nordic Ecolabelling

**Nordic Ecolabelled Supplies for microfibre based cleaning**
**Background to ecolabelling**
083/Version 2.9, 2025-08-31

# 1 Summary

This background document contains a brief description of the product group and its impact on the environment, a market overview and a background to the requirements stipulated in the criteria document.

The criteria apply to supplies for microfibre based cleaning, i.e. supplies for cleaning containing microfibres less than a 1 decitex (Dtex) thick that are intended for domestic and/or professional use. Washable cleaning cloths and mops containing microfibres that are designed for dry, damp and/or wet cleaning without the use of cleaning chemicals are eligible for Nordic Ecolabelling. Other types of supplies for cleaning, such as cleaning pads, may be encompassed by the definition if they are washable, made of microfibres and used for cleaning purposes.

Supplies for microfibre based cleaning may contain textile materials other than microfibres. Cleaning utensils and fixtures cannot however be ecolabelled separately; they must be sold as part of the ecolabelled cleaning products, i.e. be sold along with the cloths or mops.

Supplies for microfibre based cleaning impact on the environment throughout their entire lifecycle. Emissions to air and discharges to water and ground occur during primary production, the manufacture of the product itself and, finally, during the use of the product. The requirements focus on the environmental impact of Supplies for microfibre based cleaning and associated cleaning utensils during manufacture and use, which are the main phases that ecolabelling can influence. The manufacture and use of Supplies for microfibre based cleaning involve water, energy and chemicals. The criteria require applicants to describe how the product fulfils the definition of eligible products. This is done to evaluate whether the product is covered by the definition of the product group.

The environmental requirements that are stipulated apply to textile materials and any associated cleaning utensils. The requirements cover fibre and textile production, the quality of the textile, plastics and metals. The function of the product is a further area that is covered. Requirements on labelling and user instructions can be found under "General requirements".

The requirements on fibre production apply to the synthetic and natural fibres that are the most common in supplies for microfibre based cleaning (e.g. cotton, polyester, polyamide, polypropylene and viscose). The criteria promote the use of recycled materials. The environmental requirements applicable to fibre production concern emissions to water and air, the environmental impact of which is significant.

The requirements also concern processes and the chemicals used in textile production. Textile production can have a high environmental impact due to significant emissions of water, such as from the splitting of microfibres and dyeing of textile materials in supplies for microfibre based cleaning.

These requirements apply only to the wet processes in textile production and concentrate on the use of chemicals and emissions to water.

Use of chemicals may cause environmental and health problems, such as sensitisation. Accordingly, some requirements are stipulated in regard to chemicals that are harmful to health and the environment.

Process water that is released during textile production, and the chemicals it contains, impact negatively on the environment. Accordingly, the document contains requirements on waste water and wet processes.

Supplies for microfibre based cleaning must fulfil quality requirements concerning colour fastness and dimensional change. Since a microfibre cloth or mop must be washable in water, requirements are set regarding colour fastness and dimensional changes that influence the performance of the product. Since supplies for microfibre based cleaning contain various types of fibre, such as natural fibres, dimensional changes during washing must be checked.

The criteria also contain requirements on materials other than textiles that are used in cleaning utensils, such as mop handles, mop holders or other fixtures sold together with the microfibre cloth or mop. The requirements apply to plastics and metals as well as chemical products and additives used for the pre-treatment and surface treatment of metals, as additives in plastics and for bonding. These requirements are based on the proportion by weight of each type of material in the cleaning utensil (excluding textile part) that is intended for sale together with the microfibre cloth or mop. The criteria also contain requirements on additives in chemical products with the intention of prohibiting the use of chemical substances that are most hazardous to health and the environment in surface treatment (such as heavy metals).

Requirements are also set as to the proportion of recycled material, such as metals and plastics. This is considered important to save resources such as energy.

To ensure the performance of the product, the criteria contain functional requirements. The functional requirements cover the cleaning properties of supplies for microfibre based cleaning, such as the removal of dust and dirt and the reduction of bacteria. Cleaning performance is an important environmental parameter that contributes to the increasing use of supplies for microfibre based cleaning. This helps reduce the use of cleaning chemicals and water.

The requirements also encompass characteristics such as abrasion, durability and absorption.

Requirements are also stipulated in regard to packaging, take-back system, information and environmental and quality control.

The most important changes since version 1.0:

- Changes to definition and name of product group
- Introduction of requirements on textiles.
- Harmonisation with GHS/CLP classification.
- Introduction of requirements on metals.
- Introduction of requirements on plastics.
- Tightening/adjustment of functional requirements.
- New layout.

# 2 General facts about the criteria

## Products eligible for labelling

The product group is limited to washable cleaning cloths and mops containing microfibres that are used for dry/damp/wet cleaning without the use of cleaning chemicals. Microfibre cloths and mops may also contain fibres other than microfibres. The criteria encompass both synthetic and natural fibres. Other types of supplies for cleaning, such as cleaning pads, may fall under the definition if they are washable, made of microfibres and used for cleaning purposes. Cleaning utensils, such as mop handles, stands and other fixtures that are sold along with the mop, are subject to these criteria and must fulfil particular requirements regarding constituent materials (in the event that these utensils are packaged together with supplies for microfibre based cleaning).

Cleaning utensils and fixtures cannot, however, be granted a separate Nordic Ecolabel; they must be sold as a part of ecolabelled supplies for microfibre based cleaning in order to be encompassed by a Nordic Ecolabelling licence.

## Justification for Nordic Ecolabelling

Cleaning is an important tool in creating a healthy living environment. Traditionally, cleaning involves a significant use of cleaning chemicals, water and energy. Excessive use of chemicals, overdosing and unnecessarily potent cleaning agents result in significant emissions of substances that are hazardous to the environment and health. The use of microfibre cleaning products enables reductions in water, chemical and energy consumption.

The use of microfibres reduces environmental impact by reducing the emission of chemicals. The use of fewer chemicals leads to a lower risk of sensitisation and reductions in the use of water and packaging materials. The environmental, health and working environment benefits associated with the use of microfibre cleaning products has led to an increasing popularity for this type of product. There are good environmental reasons for choosing products that help reduce the use of water, energy and chemicals. There are large variations in the microfibre cleaning products currently available on the market. Ecolabelling shall promote the use of the best products on the market by setting stringent environmental, functional and quality requirements.

Cleaning performance is one major environmental parameter. Microfibre cloths and mops generally offer good cleaning performance, and clean equally well as other products, but without the use of chemicals. Good cleaning results allow less frequent cleaning and the number of operations is reduced. It is, however, of note that the cleaning performance of cloths is somewhat better than is the case for mops: as the way in which a cloth is used allows more energy to be closely focussed on the surface being cleaned.

Ecolabelled supplies for microfibre based cleaning shall be ergonomically designed. Accordingly, it is required that the cleaning utensils are designed to facilitate ergonomic working methods that reduce stress on muscles and joints. Ergonomics does not simply concern the design of the utensil but the interplay between the user and the utensil. It is vital that each utensil quickly and simply can be adapted to the optimum working posture for the task. Several important parameters are considered, such as constituent materials and weight, friction, adjustments and care of the utensil. However, Nordic Ecolabelling

has, for this revision of the criteria, been unable to develop measureable requirements in relation to ergonomics. It is relatively difficult to steer developments in relation to ergonomics and, as a result, requirements on ergonomics have been removed from the proposed criteria. The formulation of requirements in regard ergonomics presents problems that are difficult to resolve, but Nordic Ecolabelling has the option of considering the issue further in future evaluations or revisions of the criteria.

The service life of the product is the next factor of importance. The environmental impact of the product declines as its service life is prolonged. The service life of cloths and mops containing microfibre is one of the most important environmental parameters. The use of the product over an extended period, and under suitable conditions, entails many environmental and health benefits. For example, savings with regard to material, energy and water consumption, lower costs, less packaging and waste and lower risks of allergies and strain injuries. Nordic Ecolabelling therefore requires that ecolabelled microfibre cloths and mops possess excellent characteristics regarding cleaning, abrasion and durability.

Washing recommendations, and how the product is handled by the end-user, also have a major influence on environmental impact. Ecolabelled cloths and mops must, therefore, be equipped with clear instructions for use.

The criteria also contain requirements regarding chemical products that are used during production since Nordic Ecolabelling wishes to limit the use of substances that are hazardous to health and the environment.

## Criteria version and validity

The criteria for ecolabelling of microfibre cloths and mops (following consultation the name of the product group has been changed to "Supplies for microfibre based cleaning") have been developed as environmental pilot. Version 1.0 of the criteria was adopted in 2003 with a validity period from 9 October 2003 to 31 October 2006. During 2005 an evaluation of the criteria was undertaken and a number of amendments were made. A new version, version 1.1, was released. On the 13 December 2005 Nordic Ecolabelling prolonged the validity period of the document by three years, resulting in version 1.2 valid until 31 October 2009. Several changes to the requirements led to the release of version 1.3 in 2007.

On 4-5 November 2008, the Nordic Ecolabelling Board, following the evaluation of the criteria, decided to extend the validity of the criteria as version 1.4 until 30 June 2011. Further, it was decided to revise the criteria for microfibre cloths and mops in 2009. On the 21 June 2010 the Nordic Ecolabelling Board decided on a further prolongation of the validity period until 31 December 2011 (version 1.5). This decision was taken in order to allow time for the revision of the criteria to be concluded. With this revision, the environmental pilot becomes a regular product group. This means that all material and functional requirements are reviewed with the same thoroughness and documental stringency as other regular criteria. The purpose is to ensure there is a clear environmental difference between the products that are awarded a licence and other products on the market. As of now, the simple fact that cleaning using microfibre products is environmentally beneficial is by itself insufficient grounds for ecolabelling.

12 months prior to the expiry date of this criteria document at the latest, the Nordic Ecolabelling Board provides information on future ecolabelling criteria.

With this revision, the criteria version has been changed to version 2.7 and the expected expiry date is 30.06.24.

# The Nordic market

Based on current market trends, such as an increasing demand from direct and indirect customers, several new players on the market and new applications, the potential for this product group is considered significant.

The product group is also lifted by the criteria for shops, restaurants, hotels and cleaning services, which all include point score requirements based on the proportion of ecolabelled microfibre cloths and mops that are used. Many customers, above all in the hospitality industry, are environmentally conscious and choose ecolabelled products.

**Number of licences awarded for version 1.0:**

| Country | Number of licences awarded for version 1.5: | Number of registrations for version 1.5: |
|---|---|---|
| Denmark | 1 | 5 |
| Norway | 1 | 7 |
| Sweden | 8 | 2 |
| Finland | 2 | 4 |

The products that are currently ecolabelled are used for daily cleaning and are designed for domestic and professional use. The types of products that are ecolabelled vary from licensee to licensee. The various markets for these products are somewhat influential in creating this variety. The majority of ecolabelled microfibre cloths and mops are sold retail to consumers. There is a clear current trend of increased interest in ecolabelled microfibre cloths and mops on the professional market. An increase in interest for ecolabelling of microfibre cloths and mops leads to an increasing proportion of such products on the Nordic market, which has beneficial environmental effects.

**Finland**

There are already several players on the Finnish market. There are two licence holders (Sinituote Oy and Freudenberg Household Products Oy), and both are active in marketing their products through a visible presence in the media. According to one licensee, sales have risen in the past few years.

Supplies for microfibre based cleaning (cloths and mops) intended for professional use are often used in Nordic Ecolabelled hotels in Finland, and these establishments seem to be satisfied with the Nordic Ecolabelled microfibre mops and cloths. The use of micro-fibre products reduces the consumption of water and facilitates cleaning. The hotels judge the products to maintain a high quality and provide a long service life. Nordic Ecolabelled cleaning services are also found to use Nordic Ecolabelled fabric cleaning products most often.

The total turnover of ecolabelled cloths and mops on the Finnish market was €1.7 million in 2008.

**Norway**
The proportion of ecolabelled products on the Norwegian market is somewhat lower at between 1–5%. However, the Norwegian market has developed significantly in recent years. The last five years have seen a 38% increase in the turnover of microfibre cloths and mops on the consumer market. Today, roughly 700,000 microfibre cloths are sold each year in the retail trade (source: AC Nielsen).

Some of the actors on the Norwegian market: Lilleborg, Jordan, Verus, Procter & Gamble, Vileda, Nilfisk, Premiere, Ecolab, and Skovly.

**Sweden**
The Swedish market boasts several actors – some smaller companies that retail directly to the domestic consumer and other larger manufacturers that have specialised in serving the needs of the professional market. The largest producers/suppliers on the professional market include JohnsonDiversey Sverige AB, Vikan AB, Gipeco AB, Nilfisk Advance AB and Freudenberg Household Products OY (Vileda AB).

Suppliers specialising in the consumer market include Smart Products Scandinavia AB, Creative Nordic AB, Klimabolaget AB, AQA Scandinavia AB and many smaller suppliers. Consumer products are primarily sold in retail outlets.

The total turnover of ecolabelled microfibre cloths and mops on the Swedish market amounts to circa SEK 23.5 million.

**Denmark**
The use of cloths and mops containing microfibre is widespread in Denmark. They are used by both domestic consumers and professional users. The estimated annual turnover of microfibre products in retail trade is currently DKK 20 million. The turnover of microfibre cloths* on the professional market is roughly DKK 5.2 million and that of microfibre mops DKK 13 million.
* Source: SPT - Association of Danish Cosmetics, Toiletries, Soap and Detergent Industries.

The annual turnover of Nordic Ecolabelled products in Denmark amounts to DKK 6 million. The largest players on the professional market include JohnsonDiversey, Ecolab, Vileda Professional, Locon, Vikan and Stadsing (in no particular order regarding market share).

# Other labels
There are no EU Ecolabel criteria for this product group and there are no plans to develop such.

The EKU instrument (tool for ecologically sustainable procurement) has not developed health and environmental requirements for this product group.

The Öko-Tex® Standard 100 is a textile label related to the final product. The Öko-Tex® Standard 100 was developed in the early 1990s as a safety norm for companies in the textile and apparel industry. It allows a practical evaluation of the potential danger of substances in textile products and was jointly developed by the Austria-based

Österreichisches Textil-Forschungsinstitut (ÖTI) and the German Forschungsinstitut Hohenstein based on their existing test methods.

The Nordic Ecolabel and EU Ecolabel can be found across the Nordic and European markets.

The Nordic Ecolabel is the official ecolabel in the Nordic region and considers the environmental impact of the entire lifecycle of goods and services. The Nordic Ecolabel sets stringent requirements related to climate impact and the environment but also product function and quality. The vision of Nordic Ecolabelling is a sustainable society with sustainable patterns of consumption.

The EU Ecolabel is the European Union's official ecolabel, sanctioned by the European Commission. The EU Ecolabel functions in the same way as the Nordic Ecolabel. Products are assessed from a life-cycle perspective, from raw materials to retirement. To be awarded a licence, a product must fulfil stringent requirements regarding the environment, function and quality.

Only Nordic Ecolabelling has criteria for microfibre cloths and mops (currently version 1.4) but both labels have criteria for textiles. Following consultation, Nordic Ecolabelling has changed the name of the product group to "Supplies for microfibre based cleaning".

The project group has decided to harmonise the requirements in the criteria document with the Nordic Ecolabel criteria for textiles, skins and leather, version 3.4. The textile criteria are based on Commission Decision of establishing the ecological criteria for the award of the Community eco-label to textile products, as well as subsequent amendments to Decision 1999/178/EC, approved 15 May 2002.

# 3 About the revision

## Purpose of the revision

The criteria for ecolabelling of microfibre cloths and mops version 1.0 (the name of the product group has been changed to "Supplies for microfibre based cleaning" in the presently proposed criteria), which are valid from 9 October 2003 to 31 December 2011, are currently under revision. The purpose of the revision is to present a proposal regarding revised criteria based on the findings of the 2008 evaluation.

### General objectives

The proposed requirements for the criteria for the ecolabelling of microfibre cleaning products shall ensure a clear differentiation in environmental terms between the products that are awarded a licence and other microfibre cloths and mops that do not fulfil the stringent requirements on:

- Reduced environmental impact, such as a reduction in the use of cleaning chemicals.
- Better material and resource usage.
- Increased market demand for environmentally superior microfibre cleaning products.

Environmental objectives

The criteria are to be met by only the best supplies for microfibre based cleaning, within the boundaries of the product group, in terms of environmental and quality performance. In this way a reduced environmental impact may be achieved: Nordic Ecolabelled supplies for microfibre based cleaning, through improvements to resource and material inputs, have excellent cleaning properties, can be cleaned in water after use, and have been manufactured in an environmentally sustainable manner using a minimum of materials that are hazardous to health and the environment.

The revision of these criteria focuses on the following areas and parameters:

- The product definition has been revised so that it also includes microfibre products containing less than 70% microfibre.
- Methods for testing cleaning performance, durability and abrasion.
- The development of requirements in regard to the manufacturing process of the microfibre, for example the splitting process.
- Development of requirements on other textile fibres with which the microfibre is mixed. Requirements on other materials such as plastic and metals used in the microfibre products and packaging are also introduced.
- The development of requirements on chemical products for dyeing and processing of textiles, as well as in regard to the adhesives used in the bonding of these textiles to the cleaning utensil.

## About this revision

This revision has been performed by Nordic Ecolabelling under the project management of Svetlana Sopa at Ecolabelling Sweden (Miljömärkning Sverige AB).
Product group managers in the other Nordic countries during the revision:
Denmark: Sita Fabricius
Finland: Sami Karelahti
Norway: Aina Seland/Arne Godal
Sweden: Svetlana Sopa
Iceland has not participated in the revision.
Area coordinator, Procurement and Purchasing: Anders Moberg

During this revision, the secretariat has consulted manufacturers, trade organisations and the authorities in the Nordic countries. This has ensured that the requirements are relevant from an environmental perspective.

# 4 Justification of the requirements

## Introduction

Version 1.0 of these criteria was developed as an environmental pilot and was valid for a long period with few changes: two small amendments, two evaluations and two extensions. There was therefore a clear need to evaluate the requirement levels, which has resulted in a change to the structure of the criteria.

Environmental issues are in focus and can steer product development towards more environmentally suitable microfibre products. This has lead to more extensive changes, in particular regarding materials, design and new areas of use. An increase in the number of

participants in the market has resulted in a larger number of licences, and a more extensive body of information related to the current requirement definitions. Based on a brief summary of previous RPS studies, it is very clear that all the requirements are sufficiently relevant and that they cover some of the most important environmental and quality aspects such as cleaning performance, abrasion, durability, chemicals and materials.

A product impacts on the environment throughout its lifecycle, from primary production and manufacturing to use and retirement. It may be beneficial in some cases to choose a material that has a greater environmental impact during manufacturing but lower impact during later stages of the products lifecycle, such as during use. This is, for example, the case when supplies for microfibre based cleaning are used in cleaning activities.

The potential is assessed as the possible environmental benefit within the specific product group, e.g. the difference between existing products and technical innovation that is considered realistic in the short term. Potential answers the question "What environmental benefits can be achieved?" Possible environmental benefits include reductions in use of chemicals, water and energy, and improvements in material use (lower emissions of chemicals into the environment, and reduced use of water and packaging). Microfibre cleaning products produce less waste, provide significantly improved cleaning performance without the use of chemical products, and offer longer service life. Further aspects that should be taken into consideration are ergonomic, health (lower risk of sensitisation) and economic (savings in time and purchases) benefits.

All cleaning products have an environmental impact, even if it can be shown that the impact is significantly lower when cleaning is performed with supplies for microfibre based cleaning. Accordingly, it is also important to investigate whether there is scope for further improvements regarding both the manufacture and use of microfibre cleaning products. Nordic Ecolabelling can promote further reductions in environmental impact by tightening and changing current environmental parameters such as cleaning performance, friction and durability.

Tightened and new product and manufacturing requirements are fundamental drivers towards environmental benefits in areas such as:

- Fibre production, with regard to the use of chemicals and emissions from manufacturing processes.
- Textile production, with regard to the use of chemicals and emissions from manufacturing processes.
- Ergonomic design.
- Waste management.
- Further product and packaging requirements.

New and clearer requirements in regard to documentation are an additional important development in the revision.

An updated RPS analysis has been performed separately for all newly specified requirements; as well as adjustment to, and tightening, of current requirement levels.

# General facts about microfibre

## What is a microfibre?

A microfiber is a fibre weighing less than one gram at a length of 9.000 metres i.e. one denier. A similar definition is a fibre of less than one decitex (Dtex), i.e. weighing one gram per 10.000 metres. Conversion between the units is possible according to DIN 60905, p3.

Listed below is a brief description of current classifications in Dtex:
>7 coarse fibre
7.0-2.4 fine fibre
2.4-1.0 very fine fibre
1.0-0.5 microfibre
0.5-0.1 super microfibre
<0.1 ultramicrofibre
Microfibre has a thickness of <1 decitex; and it is the thickness of the microfibres that a material contains that determines its performance.

There are different types of microfibres, of which ultramicrofibres are one example. The fibres bind dirt at a microscopic level. The fibres are so thin that one gram of ultramicrofibre is 42,000 metres long.

A microfibre is most often produced from two interspun polymers. The two most common polymers are polyester and polyamide (nylon). A microfibre is a hundred times thinner than a human hair. And that is before splitting. Once split, a microfibre is 1,500 times thinner than a human hair.

## How microfibres are manufactured

The manufacture of microfibre is a very complicated process that requires expensive equipment. Accordingly, microfibre textiles are expensive. Microfibre is often manufactured from a fluid mass of 70% polyester and 30% polyamide, which is melted in highly technologically advanced equipment. The mass is then injected through a filter, thus creating the splitting process (splitting into 16 parts). Splitting can be performed both before and after the product is finished, depending on the type of product and its application. Certain fibres, with a significantly greater thickness, can have different cross-sections, but often have a round cross-section comprised of only one type of polymer that is never split. Round fibres have lower friction than a triangular profile and are less suitable for stubborn dirt or stains. The splitting process can be chemical, thermal or mechanical.

The chemical method involves using a solvent and/or alkali (such as lye) at temperatures above 100°C in conjunction with dyeing (often in the same bath). Normally, dyeing of polyester takes place in acidic media, but in certain cases alkaline media is used. Splitting at a high temperature may result in unacceptably high losses of PES and shorten the service life of the microfibre. The process frees the microfibres from each other. It is carefully contained and performed under controlled conditions. Thermal splitting is performed during production directly after cleaving using 200°C water at high pressure. With mechanical splitting, the fibre passes a further process that scratches and distresses the fibre. This is done to make the material softer. Mechanical splitting has, however, an impact on lint and the service life of fibres, which a manufacturer of cleaning textiles must take into account.

## How microfibres work

**Cleaning with microfibres**
Each cloth or mop made of microfibre contains millions of microscopic fibres that offer exceptional absorptive and cleaning properties. In cross section, each fibre has a circle of wedges (like an exploded orange) with interspersed core sections. Dust, bacteria and fluids are trapped in the grooves between the wedges by static electricity and capillary effect.

Microfibres are ten times more absorptive and offer more than ten times better cleaning performance than standard fibres. The grooves between the polyester and polyamide act as small traps for dirt.

The thinness of the fibres means more fibres per unit area. This means that more fibres come into contact with the surface being cleaned, which means quicker, more efficient cleaning.

Three factors that make microfibres so efficient:

- **Static electricity.** Microfibres contain a polyester-polyamide mix that has a positive charge. This attracts negatively charged dust and dirt.
- **Capillary force.** This force is created by the split surface of the fibre and means that microfibre products can absorb up to 6-7 times their own weight.
- The **uneven surface of the fibre breaks surface tension** (the microfibre structure leads to surface tension being spread over a much greater area, in this way reducing surface tension) and enables cleaning with water alone.

Microfibres, like other synthetic fibres, are produced from fossil raw materials. Further, process chemicals (e.g. surfactants and spinning lubricants) and the emission of volatile organic compounds (VOC) during production are some of the most significant environmental aspects. Chemicals, water and energy used during knitting, weaving, pre-processing and dyeing also impact on the environment.

# What can carry the Nordic Ecolabel?

The criteria apply to supplies for microfibre based cleaning, i.e. supplies for cleaning containing microfibres less than a 1 decitex (Dtex) thick that are intended for the private consumer and/or professional use.
Washable cleaning cloths and mops containing microfibres that are designed for dry, damp and/or wet cleaning without the use of cleaning chemicals are eligible for Nordic Ecolabelling.

Other types of supplies for cleaning, such as cleaning pads, may fall under the definition if they are washable, made of microfibres and used for cleaning purposes.

Cleaning utensils, such as mop handles, stands and other fixtures that are sold along with the mop, are subject to these criteria and must fulfil particular requirements regarding constituent materials (in the event that these utensils are packaged together with supplies for microfibre based cleaning). It must be possible to separate textiles from the rest of the cleaning utensil.

Cleaning utensils and fixtures cannot, however, be granted a separate Nordic Ecolabel; they must be sold as a part of ecolabelled supplies for microfibre based cleaning in order to be encompassed by a Nordic Ecolabelling licence.

The goal of these criteria is to promote the best microfibre cloths and mops on the market from an environmental point of view.

Cleaning with microfibre products can reduce environmental impact by lowering the consumption of water and chemicals. Ecolabelled microfibre cleaning products save resources and materials, and the products offer outstanding cleaning performance. Consumer and professional products are available for dry, damp and/or wet cleaning. The criteria ensure the maximum environmental benefits during both production and use phases. The goal is for only the best products to be able to meet the environmental, health and quality requirements, and for these to gain market share through ecolabelling.

**Microfibre content**
The proportion of microfibre required in the current criteria (version 1.0) is contained in the product group definition. The parts of a cloth or mop that come into direct contact with the surface to be cleaned may contain a maximum of 30% by weight of non-microfibre textiles. Parts of a cloth or mop that do not come into direct contact with the surface to be cleaned are exempt from this requirement (i.e. not included in the percentage calculation). Such parts include backing textile and attachments.

It has become apparent that the proportion of microfibre in the final product is not a determinant of cleaning performance. A damp mop for professional use with a low proportion of microfibre may produce equally good cleaning results as a dry mop with much higher proportion of microfibre.

The requirement of a high proportion of microfibre has shown to be a barrier for ecolabelling. The requirement is too high for many products, in particular damp and wet mops for professional use, where the proportion of microfibre must be lower for ergonomic reasons. A high proportion of microfibre increases friction, which can cause problems for cleaners. The amount of water also influences the coefficient of friction. Damp use produces the greatest amount of friction. The type of flooring also affects the amount of friction.

The coarser the microfibre, the greater the proportion of microfibre in the final product. However, the proportion of microfibre does not need to be that high to achieve an acceptable level of cleaning performance. There is no definite connection between cleaning performance and the proportion of microfibre. It is primarily the function of the product, e.g. damp, wet or dry cleaning, that determines the type and proportion of microfibre that is suitable.

In general, the proportion of microfibre depends on whether a mop is to be used for dry, damp or wet cleaning. Dry mops generally have a significantly higher proportion of microfibre.

The cleaning characteristics of fibres are mainly determined by their size and structure. The best ultramicrofibres (which are extremely thin) offer high cleaning performance even in low amounts. They are 2-3 times more effective than standard microfibres. Traditional microfibre mops are designed for floors with a smooth surface and to avoid

the use of water (due to damage, risk of slipping, long drying time or bacterial growth). The finer the fibre in the cleaning textile, the lower the proportion of microfibre in a product intended for damp or wet cleaning. Coarseness is not the only parameter. The design (cross section) influences how a fibre collects dirt and moisture.

As a mop is subject to harsh wear, a fine microfibre must be designed so as to be able to offer good durability. Other fibres are necessary to hold the product together.

The proportion of microfibre in damp and wet mops varies between roughly 10-50% by weight. This proportion varies depending on the product's intended use (dry, damp or wet cleaning), as well as the fineness/coarseness of the fibres. A lower proportion of microfibre makes it significantly easier to use the mop. Capillary force has little significance for damp and wet mopping and thus the proportion of microfibre is also less important. Of greater significance are the location of the fibres, their fineness and their degree of splitting. Good damp and wet mops for professional use finely split fibres, which reduces friction and offers improved cleaning performance.

Super microfibres (0.5-0.1 Dtex) and ultramicrofibres (<0.1 Dtex) are much lighter and often split, which means that the proportion of microfibre can be kept low.

To control the friction of the product and improve its design, different weaves and fibre mixes are used. For example, polyester reduces friction in damp applications while cotton provides better water retention for heavy-duty cleaning. The current criteria set few requirements on the other fibres in the product.

In light of the above, we propose to change the requirement stipulated in regard to a minimum proportion of microfibre in the product. Instead of a mandatory minimum limit, we propose the introduction of requirements on the fibre mix in the product to ensure environmental benefits during production. Further, we propose that the manufacturer is required to specify the proportion of microfibre in the product. It is not possible to ecolabel a fabric cleaning product that is devoid of microfibres. This is to ensure that the product offers good cleaning performance and ensure that cleaning can be performed using little water and chemicals.

With regard to the justification presented above, it is additionally proposed that cleaning microfibre cloths and mops, as the product group definition is delineated in this proposal, are instead referred to as cloths and mops containing (with) microfibre, in order to avoid misleading consumers and end-users.

## Fibre requirements

Since today's supplies for microfibre based cleaning are often comprised of a variety of fibres, it is proposed to introduce requirements on the production of a range of fibres. The requirements apply to all the fibres in the fibre mix, including the microfibres.

It is proposed that the requirements should apply to 80% by weight of the total fibre mix in the finished product. This means that all fibre material is subject to the requirement. The previous constraint of "active part of the mop", i.e. fibres that come into direct contact with the cleaned surface has proved ambiguous, has been interpreted differently by different manufacturers and depends on the type of microfibre mop.

The limit of 80% is proposed to apply to all fibres in the product. This limit has been calculated based on information from various products on the market.

## The proportion of fibres subject to fibre requirements

The revised criteria set requirements for the most common fibre types. To give the manufacture scope for product development (e.g. design) a lower limit of 5% has been introduced for fibres that do not need to fulfil any form of requirement. This means, for example, that it is not always necessary to document attachments to supplies for microfibre based cleaning.

## Amount of recycled fibre

At least 80 per cent of all fibres in the product must either fulfil the fibre-specific requirements or be derived from recycled materials. The term "recycled fibre" refers to fibres won from waste materials, from the textile and clothing industry, or from post-consumer waste (textiles and similar), as well as to used products that have been collected for recycling.

It is important to promote the use of recycled materials, from the point of view of resource conservation. Since good function is a prerequisite for ecolabelling, requirements on recycled fibre can only be introduced if the cleaning performance of the product can be maintained. This requirement applies both to the microfibre and other types of fibre, such as polyester. The investigation has shown that the use of recycled fibre is commonplace for the other fibres that are mixed with the microfibre in the product. Nordic Ecolabelling has, therefore, chosen to promote the use of recycled fibres in the criteria.

## Prohibited fibre material

The review process investigated whether there were certain fibres that from an environmental or health perspective should not be permitted in ecolabelled microfibre products. The investigation has not found sufficient evidence to introduce such a requirement.

## Ecolabelling of a complete cleaning set

Domestic mops are often sold together with a mop handle, mop holder and other fixture. Manufacturers of supplies for microfibre based cleaning often wish to ecolabel the entire set. The new criteria introduce this possibility by setting specific material requirements applicable to utensils, fixtures and other details. The most common materials are metals and plastics. The most common metal used in cleaning utensils is aluminium. The most common plastics are polypropylene, polyethylene, polyester, styrene, PVC and polyamide. For example, a mop holder often comprises plastic, textile and metal. The draft criteria set environmentally relevant and steerable requirements regarding these materials.

Cleaning utensils, such as mop handles, stands and other fixtures that are sold along with the mop, are subject to these criteria and must fulfil particular requirements regarding constituent materials (in the event that these utensils are packaged together with supplies for microfibre based cleaning).

It should however be noted that these utensils cannot be ecolabelled separately, since the main purpose of the criteria is the ecolabelling of supplies for microfibre based cleaning, not the associated utensils.

Since other cleaning utensils are covered by the product group definition, and are eligible for Nordic Ecolabelling when sold packaged together with cleaning cloths and mops containing microfibre, it is proposed that the name of the product group is altered to "supplies for microfibre based cleaning" in order to ensure that the name of the product group encompasses all type of fabric cleaning products that fall under the definition, as well as preparing the way for any future widening of the scope of the product group to cover other types of fabric cleaning products (in addition to cloths and mops with accompanying cleaning utensils and attachments).

### Recommended washing temperature

Nordic Ecolabelling has considered introducing a maximum recommended washing temperature of 60°C for the product group. However, a restriction on the product group definition in terms of washing temperatures was not one of the issues under review for the latest revision. Moreover, necessary information has not been available. Thus the project group has not been able to implement such a restriction on the product definition in regard to washing temperatures in this version of the criteria. Nonetheless, recommended washing instructions and requirements on washing qualities should be considered separately; and this is achieved by stipulating requirements on specific instructions in regard to recommended and maximum washing temperatures. It must be possible for those products intended for hygienic conditions, which require washing at significantly higher temperatures, to be washed at higher temperatures in order to avoid misleading customers.

In order to take into consideration possible energy savings in relation to washing, Nordic Ecolabelling has chosen to stipulate requirements in regard to products that are not marketed as intended for particular hygienic conditions by urging washing of these at 60 °C and at maximum temperatures as required.

### Ecolabelling of pre-prepared cleaning utensils/systems

Nordic Ecolabelling has considered whether to include pre-prepared cleaning utensils in the product group (e.g. mops that are pre-impregnated with a cleaner or floor care product). The criteria for supplies for microfibre based cleaning will, if possible, be expanded to include similar products at the next revision.

# Requirements

## 1 Environmental requirements

The environmental requirements contained in this section apply to the product that is intended for Nordic Ecolabelling. If only cloths and mops contain microfibre are to be Nordic Ecolabelled, the requirements stipulated in Section 1.2 are to be fulfilled by the applicant. If the licence is to cover other associated cleaning articles and attachments, then further requirements, as set out in Section 1.3, must also be met.

Section 1.1 requires applicants to describe how the product fulfils the definition of eligible products. Section 1.2 contains environmental requirements applicable to textile materials (natural and synthetic) used in microfibre cloths and mops. The requirements apply to the most common textile fibres such as cotton and other natural cellulosic fibres, polyimide, polyester, polypropylene and viscose. Requirements are also placed on processes and chemicals; these, however, apply only to the wet processes in textile production. This section also includes requirements on the quality of textiles.

Section 1.3 contains environmental requirements on materials other than textiles that are used in the cleaning utensils (e.g. handle, holder or other fixture) and that are sold along with the microfibre cloth or mop. The requirements apply to plastics and metals as well as chemical products and additives used for the pre-treatment and surface treatment of metals, as additives in plastics and for bonding. These requirements are based on the proportion by weight of each type of material in the cleaning utensil (excluding textile part) that is intended for sale together with the microfibre cloth or mop.

## 1.1 Product information

**General information and Details of the product (R1 – R2)**

The applicant shall provide details of the supplies for microfibre based cleaning that have been submitted for Nordic Ecolabelling. To evaluate whether the product is eligible for the product group, the criteria require a description of the product and its area of use.

This is a new requirement in this version of the criteria.

## 1.2 Textiles (R3-R21)

Textiles include both synthetic and natural fibres. All textile materials that are used in cloths and mops must fulfil the requirements.

**Textiles carrying the Nordic Ecolabel or EU Ecolabel (R3)**

The applicant shall specify whether the textiles that are used in supplies for microfibre based cleaning carry the Nordic Ecolabel or EU Ecolabel.

Textiles that carry the Nordic Ecolabel or EU Ecolabel fulfil requirements R4-R17 and R19-R21 in Section 1.2. If the textiles are not labelled, all the applicable requirements in Section 1.2 of this criteria document must be fulfilled.

Textile requirements R4-R17 and R19-R21 in this criteria document are harmonised with the Nordic Ecolabel requirement for textiles, skins and leather, version 3.4. These criteria are based on the ecological criteria for the awarding of the Community Ecolabel to textile products established by decision of the Commission, as well as subsequent amendments to decision 1999/178/EC as approved on the 15th May 2002. This means that textiles that are licensed to carry the Nordic Ecolabel or the EU Ecolabel already meet the requirements specified in this section; in this way use of ecolabelled textiles is favoured in the manufacturing of Nordic Ecolabelled supplies for microfibre based cleaning.

This is a new requirement in this version of the criteria.

### 1.2.1 Textile fibres (R4-R9)

**Proportion of fibre in the product (R3)**

Fibre-specific requirements have been established for cotton and other natural cellulosic seed fibres, polyamide, polyester and polypropylene, and viscose. Other fibres, for which no specific requirements have been set, may also be used. If the product contains less than 5% of a certain type of fibre in proportion to the total weight of textile fibres, it is not necessary to fulfil the requirements of Section 1.2.1 for that particular fibre. These requirements are further not applicable if the fibres are derived from recycled material. The term "recycled fibre" refers to fibres won from waste materials, from the textile and

clothing industry, or from post-consumer waste (textiles and similar) as well as to used products that have been collected for recycling.

At least 80 per cent of all fibres in the product must either fulfil the fibre-specific requirements or be derived from recycled materials. Requirements are stipulated in regard to the most common types of fibre materials in cloths and mops. Polypropylene, polyester and polyamide are examples of fibres that are used both in the production of microfibres and as standard fibres. Cotton and viscose are the most common fibres mixed with synthetic fibres. We have therefore chosen to place requirements on these fibres. This is a new requirement in this version of the criteria.

**Cotton and other natural cellulosic seed fibres (R5)**

Pesticides, which impact on the environment and health, are often used in the cultivation, transport and storage of cotton and other natural fibres. Pesticides are a group of chemicals that are designed to kill, limit the development of, or in some other way regulate the growth of harmful organisms.

Microfibre products, such as mops, can contain a high proportion of cotton (70-90%). It is therefore important to stipulate requirements on this type of fibre. Cotton and other natural cellulosic seed fibres (hereinafter referred to as cotton) shall not contain more than 0.05 ppm (sensibility of the test method permitting) of each of the following substances: aldrin, captafol, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, hexachlorocyclohexane (total isomers), 2,4,5-T, chlordimeform, chlorobenzilate, dinoseb and its salts, monocrotophos, pentachlorophenol, toxaphene, methamidophos, methylparathion, parathion, phosphamidon. These substances are pesticides used during the production of cotton and other natural fibres. (Background report to the ecological criteria for the award of the Community eco-label to textile products, 15 May 2002). These substances are also found on the list chemicals subject to the PIC procedure (Prior Informed Consent)*.

**PIC procedure: Prior Informed Consent*
*The PIC procedure helps participating countries learn more about the characteristics of potentially hazardous chemicals that may be shipped to them, initiates a decision-making process on the future import of these chemicals by the importing countries themselves, facilitates the dissemination of this decision to other countries, and encourages exporting countries to take measures to ensure that unwanted exports do not occur (http://irptc.unep.ch/pic/volpic/h2.html). The PIC procedure is voluntary - it has been unanimously accepted by member countries of FAO and UNEP and is supported by the leading chemical industry associations and a variety of non-governmental organisations. The PIC procedure was adopted at the Rotterdam Convention in 1998. 80 countries signed the convention, and by august 2001 16 of these countries have ratified the convention. Pesticides, industrial and consumer chemicals that have been banned or severely restricted for health or environmental reasons by the participating governments can be included in the procedure. In addition acutely toxic pesticide formulations, which present a hazard under the conditions of use in developing countries, may also be included.*

This requirement does not apply where more than 50% of the cotton content is organically grown cotton or transitional cotton, that is to say certified by an independent organisation to have been produced in conformity with the production and inspection requirements laid down in Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs(1)*.
**(1) EGT L 198, 22.7.1991, p1*

This requirement does not apply if documentary evidence can be presented that establishes the identity of the farmers producing at least 75% of the cotton used in the final product, together with a declaration from these farmers that the substances listed

above have not been applied to the fields or cotton plants producing the cotton in question, or to the cotton itself.

Kapok (*Ceiba pentandra*) is a species in the mallow family that most probably originates from tropical America and possibly also Africa but that can be found all over the world in all climate zones. Kapok is exempt from this harmonised requirement since the project group has not come across this type of fibre in cloths and mops. It is a weak fibre that cannot be spun, which makes it impossible to use in microfibre products that are subject to heavy-duty wear. This is a new requirement in the criteria.

**Polyamide (R6)**

The emissions to air of nitrogen dioxide ($N_2O$) during monomer production, expressed as an annual average, shall not exceed 10 g/kg polyamide 6 fibre produced and 50 g/kg polyamide 6.6 fibre produced.

Nordic Ecolabelling sets requirements limiting the emission of nitrogen dioxide ($N_2O$) arising from polyamide production. Nitrogen dioxide is a greenhouse gas that is 270 times more damaging than carbon dioxide. Nitrogen dioxide also depletes the ozone layer. The two greatest industrial sources of $N_2O$ are the production of nitric acid ($HNO_3$) and adipic acid. Adipic acid is created in a two-stage process where $HNO_3$ is used in the second stage and is the cause of the $N_2O$ emissions. Adipic acid is primarily used in the production of polyamide. Emissions of $N_2O$ have been reduced in recent years through thermal and catalytic cracking, especially in the production of adipic acid. This is a new requirement in the criteria.

**Polypropylene (R7)**

Antimony is a toxic semimetal. The quantity of antimony in the polyester fibre must not exceed 260 ppm. The emissions of VOCs during polymerisation of polyester, expressed as an annual average, shall not exceed 1.2 g/kg of produced polyester resin.

Nordic Ecolabelling requires that polyester fibre is produced with limited amounts of antimony. Antimony is used in the plastics industry as a catalyst, pigment and stabiliser. Antimony-free polyester fibre exists, but the supply is currently so low that is not feasible for Nordic Ecolabelling to require the use of such polyester.

Organic solvents give rise to volatile organic compounds (VOC) which in turn produce ground ozone. Ground ozone is produced by a photochemical reaction between volatile hydrocarbons and nitrous oxides. Ozone is one of several photochemical oxidants. Ground ozone is harmful to vegetation, materials and human health. This is a new requirement in the criteria.

**Polypropylene (R8)**

The use of lead-based pigments is prohibited by this requirement.

Plastics are dyed to make a product more appealing. Pigments can also increase the service life of a plastic by acting as a stabiliser.

Lead chromate/molybdate is used as both a stabiliser and pigment (plastic additive) in thermoplastic products. Pigments based on lead chromate/molybdate are for example used in some types of plastics such as polypropylene.

Products that contain lead, if burnt, increase lead fallout from the air. The greatest environmental hazard that has been identified regarding the use of products containing lead is its direct toxic effect on birds and other animals that ingest it directly or through organisms lower in the food chain. The lowest level of lead in the blood that has been shown to have general health effects is 0.3 μmol/l. Such levels disrupt the metabolism, kidneys and cardiovascular system. Lead can also damage the nervous system at low levels. Sensitivity is great in foetuses and small children during the development of the brain. Paediatric studies have shown that blood levels of 0.5 μmol/l can impair development, result in lower IQ and cause behavioural disorders. This is a new requirement in the criteria.

### Viscose (R9)

Regenerated fibres are produced by breaking down the molecules in cellulose and transforming – regenerating – these, using chemicals. The fibres acquire a new molecular structure that is suitable for textile fibre production. The most common cellulosic fibre in microfibre products is viscose. The method of manufacturing viscose was developed at the turn of the twentieth century. Paper pulp is the most common primary material for producing viscose fibre.

Viscose production thus shares environmental issues with paper production. Large quantities of carbon disulphide are used to convert the cellulosic pulp into viscose fibre. Some of the carbon disulphide can be reused, but significant sulphur emissions to the air are unavoidable. Further, zinc salts and other chemicals that give rise to large quantities of polluted water are formed during the manufacturing process. Viscose fibres are often bleached twice. First, the raw material (paper pulp) is bleached; and, finally, the viscose fibre itself is bleached to remove impurities from the manufacturing process.

The halogenated organic compounds that are released into nature are often persistent. They build up in the fatty tissue of organisms and accumulate in the food chain. AOX is only used as a measure to monitor and control organic halogens (including chlorine). AOX are spread by the pulp and paper industries during bleaching. These substances are fat soluble and therefore accumulate readily in fatty tissue in animals and humans. AOX can affect reproduction, the endocrine system, the metabolism and the immune system. Accordingly, the criteria stipulate that the amount of AOX in fibres may not exceed 250 ppm.

The viscose solution is extruded through nozzles into a coagulation bath. The coagulation bath contains sodium sulphate, sulphuric acid and zinc salts. The wet spinning of viscose produces emissions of zinc into water, which may cause damaging long-term effects on the aquatic environment. Accordingly, the emission to water of zinc from the production site during the production of viscose fibre, expressed as an annual average, is not permitted to exceed 0.3 g/kg.

The criteria also stipulate that, for viscose fibres, the sulphur content of the emissions of sulphur compounds to air from processing during fibre production, expressed as an annual average, shall not exceed 120 g/kg filament fibre and 30 g/kg staple fibre. Where both types of fibre are produced on a given site, the overall emissions must not exceed the corresponding weighted average.

Nordic Ecolabelling set requirements on emissions of sulphur compounds to air from the processing during viscose fibre production, expressed as an annual average, since

such compounds cause the acidification of soil and water. This is a new requirement in the criteria.

### 1.2.2 Processes and chemicals (R10-R19)

These requirements apply only to wet processes during textile production, which can have a high environmental impact due to significant emissions of water, such as from the splitting of microfibres and dyeing of textile materials in mops and cloths containing microfibre.

These requirements are new and concern chemicals found in chemical products as well as aspects of the production process, such as purification of waste water and consumption of resources during textile manufacturing.

The primary environmental impact of the textile industry arises from the quantity of water released and the chemical load of this water. Other important issues are energy consumption, emissions to air, solid waste and odours, which in some treatments can cause significant inconvenience.

#### Production chemicals (R10)

In accordance with requirement R10, the applicant must give a report of all chemical products added to the textile material, or with which it has been treated, providing documentation in respect of the product's complete name, safety data sheet, function, supplier, process in which it has been used. This is in order to ensure that all relevant chemicals are documented. Nordic Ecolabelling requires that safety data sheets are provided together with applications for purposes of the evaluation of declarations. This is a new requirement in the criteria.

#### Formaldehyde (R11)

The amount of free and partly hydrolysable formaldehyde in the final fabric shall not exceed 30 ppm. This limit is stipulated since mops and cloths come into direct contact with the skin. The limit is unchanged from the present criteria, version 1.5, as it seems to be set too stringently for these types of products, i.e. there are instances of products on the market that have a level of formaldehyde content that is higher than 30 ppm. This requirement is harmonised with the Nordic Ecolabel criteria for textiles, skins and leather (version 3.4).

The level is specified in order to control the use of chemical products that contain formaldehyde during production, especially in Asia, where the majority of microfibre is produced. Both in gaseous form and as a solution, formaldehyde is highly acutely toxic, primarily damaging the kidneys, liver and nervous system. It accumulates in the body and is carcinogenic in the long term. Accordingly, requirements are stipulated in order to minimise the risk of exposure.

#### Biocides and biostatic products (R12)

Biocides are often used during the cultivation, transport and storage of fibres, in particular natural fibres. Pesticides are a group of chemicals that are designed to kill, limit the development of, or in some other way regulate, the growth of harmful organisms.

Pesticides can be categorised as plant protectants or biocides. Plant protectants (e.g. herbicides, insecticides and fungicides) are primarily used in farming while biocides are most often used in industrial applications.

Biostatic products can also be used during fibre and textile production. Such products have a biostatic effect: they act as a mild disinfectant when disturbing the biofilm and subsequent further disinfection is recommended. Since natural fibres, such as cotton, are common in mops designed for professional use, there is a risk that these fibres contain residues of pesticide used during cultivation. Furthermore, biocides, such as chlorophenols (and their salts and esters), PCB and organic tin compounds can be used during transport and storage to prevent the growth of microorganisms. The criteria therefore stipulate the non-use of chlorophenols (their salts and esters), PCB and organic tin compounds. This is done in order to control their use during the production, transport and storage of natural fibres. Such biocides are uncommon in Europe but in Asia, where most fibres are produced, their use is commonplace.

Products from raw cotton to finished textiles are often transported long distances. It is sometimes clear that chlorophenols are not used. For such cases the criteria allow an exemption from testing for chlorophenols. Several organic substances, such as chlorophenols, PCBs and organic tin compounds, also present a serious health risk and can cause long-term damage to flora and fauna. The risk of negative effects to animals and humans increases if a substance is persistent in nature, and in particular if it accumulates in living tissue. Cancer, liver damage and behavioural disturbances are examples of problems caused by organic environmental toxins.

**Chlorophenols**
Chlorophenols are produced industrially for use directly as pesticides and impregnating agents, but also as an intermediary product in the production of other pesticides. In many parts of the world, chlorophenols are still used as a biocide within the textile industry. Chlorophenols (their salts and esters) are also used during dyeing and fibre reinforcement. They may also be used as preservatives during transportation and storage of textiles, in places such as Hong Kong and China. Current evidence suggests that exposure to chlorophenols can cause endocrine disruption and liver and kidney damage. They are also highly toxic to aquatic organisms.

**Polychlorinated biphenyls (PCB)**
Polychlorinated biphenyls (PCB) are a group of persistent substances. Large quantities of these environmental toxins have been released into nature. Since PCBs have an affinity to fats (are hydrophobic), they are often attracted to organic materials such as living organisms or organic coal in sediment. The production of PCBs has been phased out but large quantities are still found in sediment, from where they subsequently spread. Polychlorinated biphenyl (PCB) is a generic name for a number of similar substances that contain a considerable amount of chlorine. A biphenyl is chemically composed of two aromatic rings.

The use of PCBs in Sweden was banned in 1978 and PCBs have since been phased out, most recently through regulation SFS 2007:19. However, they continue to present a global environmental problem. PCBs are stable, bioaccumulative, highly toxic to aquatic organisms and impair the fertility of fish and aquatic mammals, such as seals.

**Organic tin compounds**

There are four main classes of organic tin compounds, classified by the number of constituent groups: tetra-, tri-, di- and mono-organic tin compounds. For example, triorganic tin compounds act as biocides and are used as preservatives. They have properties that very hazardous to health and the environment. Certain tin compounds can impair the immune system following repeated exposure, may cause skin and eye corrosion or irritation and may have reproduction toxic and mutagenic effects. There is also evidence that suggests that some organic tin compounds should be classified as environmentally hazardous and persistent.

Organic tin compounds, such as TBT, have been used, for instance in textiles, as toxins with broad spectrum biocidal effects. Under favourable, oxygen-rich conditions, such compounds decompose to less toxic dibutyl tin (DBT), further to monobutyl tin (MBT) and finally to free tin ions (Sn4+). Under anaerobic conditions, such as in sediment or locations with oxygen-free water, virtually no decomposition occurs. Such conditions can mean half-lives of many years or even decades. The sediment acts as a depot from which TBT can later be released. TBT contaminated sediment can over a long period of time act as a secondary source of toxins and ecotoxins. TBT changes and disrupts the production of hormones that control development, growth and fertility in animals and humans.

It must also be ensured that biocides and biostatic products, such as triclosan, are not used in such a way that they are emitted during use of the product. Triclosan ($C_{12}H_7Cl_3O_2$ or 5-chloro-(2,4-dichlorophenoxy)phenol or 2,4,4'-trichloro-2'-hydroxydiphenyl ether) is an organic antibacterial substance that has functional groups that make it both a phenol and an ether. It is an antibacterial substance that counteracts bad odours, such as those that may arise in textiles and cleaning products. It is a skin irritant and may have long-term effects on the aquatic environment.

Triclosan's environmental hazard assessment according to KIFS 2001:3 is Dangerous for the environment, N (the substance must be marked with the environmental danger symbol), R50 – Very toxic to aquatic organisms and R53 – May cause long-term adverse effects in the aquatic environment. Triclosan has the highest risk quotas for water, which indicates that these substances may have a negative impact on the environment. Nordic Ecolabelling considers triclosan to be bioaccumulating and prohibits its use in products. This is a new requirement in the criteria.

**Impurities in dyes (R13)**

Organic dyes are often used to dye textiles, e.g. plant dyes or synthetic dyes that are soluble in water, alcohol or similar. Insoluble, generally inorganic, pigments are also used, primarily for printing on the textile. This means that the requirement regarding impurities is not relevant to the product group. Subsequently, no requirements are set for impurities in pigments. However, the project group has decided to stipulate requirements in respect of organic dyes, which are most often used for the dyeing of the fibre types within the product group (e.g. vegetable fibres such as cotton and synthetic fibres such as polyester, polypropylene and polyamide).

Different fibres have different affinities to different dyes. Accordingly, different organic dyes are used to colour different fibres: example include direct dyes and reactive dyes, disperse dyes, basic dyes and sulphur dyes that are used for animal, vegetable and synthetic fibres. Reactive dyes are used for animal, synthetic and vegetable fibres (most often for cotton).

Disperse dyes, which are sparingly soluble in water, are used for polyester fibres and some other synthetic fibres. Polyester fibres are almost exclusively coloured using disperse dyes. Other types of dye, such as basic dyes and sulphur dyes, are also used to a limited extent for cotton. Metal complex dyes, which in practice are chelated acid dyes, are primarily used to dye animal fibres such as wool and silk and are exempt from this requirement. This type of dye is named after the acid environment used for dyeing (pH < 7). Pure acid dyes produce the most brilliant colours.

Metal complex dyes are one type of acid dye. These dyes give a subdued colour. Since animal fibres are not used in microfibre cloths and mops and since synthetic fibres (such as polyester, polyamide and polypropylene) and vegetable fibres (such as cotton) are most common, the project group considers that requirements on metal complex dyes are not relevant to this product group.

Use of different types of dyes for dyeing fibres has a negative impact on the environment and health. Issues arise both during the dyeing process, when dye residues are emitted in waste water, and when the textile becomes waste and is incinerated or sent to landfill. For example, there are disperse dyes that may cause skin irritation.

The biodegradability of individual dyes is not well documented. In general, dyes have a high absorptive power, which means that the components of dyes (including other ionic metal compounds) in the waste water from dye works to a high degree accumulate in the sewage sludge. Accordingly, from environmental, health and cost perspectives, it is vital to reduce dye residues in the dye bath and on the fibres. It is important that the dye fastens to the textile so that so little dye as possible is released in waste water. In general, the deeper the colour, the more dye residues in the dye bath. The release of these residues leads to the concentration of heavy metals in sediment.

To reduce the use of heavy metals in dyes, and the emission of these into nature during the dyeing process, requirements are set regarding metal compounds in the dyes that are used during fibre dyeing. This is a new requirement in the criteria.

**Azo dyes (R14)**

Azo-based dyes that through reductive cleavage produce carcinogenic aromatic amines (see Appendix 3) are prohibited. The Ecological and Toxicological Association of Dyes and Organic Pigments Manufacturers (ETAD) has compiled a list of aromatic amines that are formed during the reductive cleavage of certain azo dyes and that are suspected to be carcinogenic. These are prohibited within the European Union. Some dyes are also allergens. This list is generally accepted and well known throughout Europe.

The requirement on azo dyes in the final product is included to prohibit the use of such dyes in the dyeing of textiles. Azo dyes are organic compounds that contain the colouring azo function (N=N-). Often, the azo group is bound to an aromatic ring and the azo dye can decompose to the aromatic amine arylamine. This can occur chemically by reductive cleavage or through the body's enzymes. Some azo dyes can also decompose to aryl-amines during storage due to light or high temperatures. Some arylamines are considered carcinogenic, and the most well known these is aniline. It is important to note that not all azo dyes are based on arylamines.

Azo dyes are used to dye textile fibres, in particular cotton, but also viscose and other synthetic fibres. They are considered easy to use and comparatively cheap, and they

produce clear, strong colours. There are approximately 2000 azo dyes on the market, and the majority of these are water soluble and considered easily absorbed by the body. This may occur through inhalation and ingestion of dust and aerosols and through skin contact.

Azo dyes can also be toxic to aquatic organisms and may cause long-term damage to aquatic environments. It is probable that arylamines, given off by the dye, can be absorbed through the skin and can accumulate in the body. Some arylamines are classified as sensitising on skin contact, irritating to the eyes and toxic through inhalation and ingestion, or very toxic through inhalation, skin contact and ingestion. Some arylamines are also classified as toxic or very toxic to aquatic organisms and as causing long-term damage in aquatic environments. This is a new requirement in the criteria.

**Dyes that are carcinogenic, mutagenic or reproduction toxic (R15)**

Dyes classified as carcinogenic, mutagenic or toxic to reproduction must not be used. The same applies to colour preparations which must not contain more than 0.1% by weight of CMR substances. One of the goals is for the environment to be free of substances that can threaten human health. Therefore, there are requirements that these substances may not be used. This is a new requirement in the criteria.

On 18 February 2020, the European Commission decision was published that titanium dioxide (TiO2) should be classified as a suspected carcinogen (category 2) when inhaled in accordance with the CLP Regulation. Consequences are that the use of TiO2 goes against Nordic Ecolabelling's requirements for the presence of CMR substances.

Classification as suspected carcinogen is only applicable to mixtures in powder form containing at least 1% titanium dioxide particles, which are in the form of or incorporated into particles with an aerodynamic diameter of ≤ 10 μm. If titanium dioxide particles or titanium dioxide mixtures do not exist in this specific form, the classification does not apply. Liquids and certain solid mixtures are not classified, and this is the reason why Nordic Ecolabelling has made an exception for the use of titanium dioxide in wet and solid products.

**Potentially sensitising dyes (R16)**

Dyes that are potentially sensitising may not be used. This requirement is set to limit the risk of users experiencing allergic reactions following the use of the product.

Full C.I. and CAS numbers have been added to the list of dyes. It should also be noted that the list of potentially sensitising substances has been extended to include the dye C.I. Disperse Brown 1 CAS 23355-64-8, which is not listed in the current Nordic Ecolabel criteria for textiles. The product group has chosen not to include this substance in the list of prohibited substances in order to facilitate harmonisation of requirements. This is a new requirement in the criteria.

**Auxiliary chemicals (R17)**

There are several problematic substances that are difficult to prohibit through requirements on a product's chemical composition. Accordingly, Nordic Ecolabelling has compiled a list of substances that may not be added to a product. The aim of the list is to prohibit only the substances that are not forbidden by other requirements.

**Alkylphenolethoxylates (APEO) and alkylphenol derivatives (APD)**
Alkylphenolethoxylates (APEO) and alkylphenol derivatives (APD) are a group of surfactants that show endocrine disruptive characteristics. Further, their products of decomposition are not biodegradable and are considered dangerous to the environment. Accordingly these substances are prohibited.

Phenol is composed of an aromatic ring and an hydroxyl group. The alkyl chain may vary in length, for example bytyl, nonyl or dodecyl which have four, nine and twelve carbon atoms respectively. Alkylphenols are used to produce derivatives such as alkylphenolethoxilate. Alkylphenolethoxilates are surface active substances that are used as surfactants. The majority of all nonylphenol produced is used in the manufacture of nonylphenolethoxilate, the use of which, however, declined in Sweden during the 1990's. Nonylphenolethoxilate is comparatively readily biodegradable to nonylphenol as its product. Nonylphenol is persistent and bioaccumulates.

Many alkylphenols are toxic to aquatic organisms. Most toxic are those with a long alkyl chain, i.e. octyl, nonyl and dodecylphenol. Nonylphenol is classified as very toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment. Nonylphenol has also been shown to have oestrogenic effects. Feminisation of male fish has been observed. An EU risk (programme for existing substances) evaluation of octylphenol is currently underway. Data in the risk evaluation suggests that octylphenol has similar properties to nonylphenol, both regarding its danger to the environment and oestrogenic effects. Nonylphenol and nonylphenolethoxilate are prohibited in some applications in the European Union through Council Directive 2003/53/EC.

**Dihydrogenated tallow alkyl dimethyl ammonium chloride (DHTDMAC), distearyldimethyl ammonium chloride (DSDMAC), ditallow dimethyl ammonium chloride (DTDMAC),**
These are often used as plasticisers and are regarded as a group of substances displaying a very high degree of ecotoxicity. Accordingly, these substances may not be present in any of the preparations or mixtures used.

**LAS**
Linear alkylbenzene sulphonates (LAS) are anionic surfactants that are not anaerobically biodegradable; and are therefore undesirable. LAS dissolve fats and oils, which is a desirable property for detergents. However, it is very unsuitable for them to be released into the environment as they can accumulate in animal tissue. They work best in an alkaline media and dissolve best in warm water. LAS are readily biodegradable in an aerobic environment.

The results from OECD tests for biodegradability:
Readily biodegradable >70 % after 28 days. (OECD 301A)
Readily biodegradable >60% after 28 days. (OECD 301B)
Biodegradable >90 % (OECD 301A)

OECD tests for ecotoxicity give the following values:
Acute fish (LC50) 96 h 1-10 mg/l Cyprinus carpio (OECD 203)
Acute Daphnia (EC50) 48 h 1-10 mg/l Daphnia magna (OECD 202)
Acute algae (EC50) 72 h 10-100 mg/l Scenedesmus subspicatus (OECD 201)

Previously, only LAS that contained carbon chains of a certain length were prohibited due to high acute fish toxicity. All LAS are persistent in anaerobic environments and/or low temperatures.

**EDTA, NTA and DTPA**

Ethylene diamine tetraacetate (EDTA) and its salts, nitrilotriacetate (NTA) and DTPA are suspected of mobilising heavy metals in certain environments due to the formation of complexes. EDTA is also not readily degradable. The toxicity to aquatic organisms of NTA is moderate to low and the results of degradability tests have varied.

**NTA** is classified as Carc Cat.3 (EU, 2008b). NTA is therefore prohibited in these criteria due to its classification. In order to simplify and clarify the application process, Nordic Ecolabelling has chosen to prohibit NTA in all mixtures and preparations used. Accordingly, these substances are banned.

DTPA has the same properties as EDTA. Ethylene-diamine-tetra-acetate (EDTA) and dithylene triamine pentaacetate (DTPA) are not readily biodegradable and, according to the EU's risk evaluation, in conditions found in municipal wastewater treatment EDTA is non-biodegradable or poorly biodegradable (Cefic, 2009). This is a new requirement in the criteria.

#### Nanoparticle additives (R18))

Nano-metals, nano-carbon compounds and/or nano-fluorine compounds may not be actively added to chemical products.
**Nanoparticles are defined as microscopic particles with dimensions smaller than 100 nm. Nano-metals, for example, include nanosilver, nanogold and nanocopper. The requirement does not apply to any trace presence of nanoparticles that have not been added in order to achieve a specific functionality.*

The prohibition of actively added nanomaterials in Nordic Ecolabelled products is based on a cautionary principle (Nordic Ecolabelling, 2009b). The requirement does not apply to any trace presence of nanoparticles, for instance in raw materials, that have not been added in order to achieve a specific functionality.

Nanomaterials are defined as microscopic materials that in at least one dimension are smaller than 100 nm. Examples of nanometals include nanosilver, nanogold and nanocopper. Nanometals such as nanosilver, which is categorised by public authorities in the United States as a biocide, and nanocopper currently attract particular attention. Nanotechnology utilises unique properties that occur at atomic and molecular level. For example, many substances become far more reactive at nano-level. One example is gold, which is normally extremely stable but at nano-level is chemically reactive.

Particles at nano-level have particular properties that may be harmful to the environment or health. Simply put, products may emit nano-particles which in turn may be able to penetrate deep into the lungs or penetrate the skin or other barriers in the body or nature. The reactive properties of nanoparticles can damage the tissue of organisms that are exposed to such particles. In general, the health and environmental effects of nanoparticles are poorly known.

Nanosilver is effective against bacteria and other microorganisms. As a result, more and more products contain nanoparticles of silver; and this substance is just one example among many. Nanoparticles of carbon have very different properties from those

normally presented by carbon. Often, a substance becomes more toxic and can cause damage to the lungs that can lead to cancer. Nanoparticles can also migrate from the lungs to other parts of the body. They are not trapped by the filter that the lungs constitute. They have the capacity to enter the blood stream and, from there, reach other organs, such as the heart. Researchers have demonstrated that nanocarbon particles accumulate in the gills of fish swimming in contaminated water.

Nanoparticles can also reach the brain via the olfactory nerve which connects the nose to the brain. Researchers have shown that nanoparticles of both manganese oxide and gold can enter this way. Above all, nanoparticles may be hazardous for those working with them, as they may inhale nanoparticles present in the working environment.

Based on a precautionary principle, Nordic Ecolabelling prohibits the active addition of nanoparticles.

These requirements are new since the currently valid criteria.

**Chrome mordant dyeing**
The relevance of stipulating requirements on chrome mordant for this product group has been a subject of some discussion. Mordant is used to open the washed fibres and improve their receptiveness to dyeing. Following this treatment, the fibres are dyed in a dye bath at a specified temperature for a set time. To achieve good colourfastness, post-mordanting with metals is required. Dyeing occurs through the conjoining of certain substances such as iron, chrome, zinc oxide and other alkali.

Mordanting produces large emissions of metals. This treatment is only applicable to certain types of fibre, such as wool and silk. Cotton, for example, cannot be treated with metal oxides. Since this mordanting is primarily used on fibres that are not used in microfibre cloths and mops, it has been determined that chrome mordant dyeing is not relevant to the product group. Chrome mordant dyeing is no longer performed in the Nordic region.

**Waste water from wet processes (R19)**
The chemical oxygen demand (COD) in waste water from wet processes must not exceed 25 g/kg calculated as an annual average; and any excess water released directly to surface water must have a pH value in the range 6-9 and a temperature below 40°C.

This requirement has been proven relevant regarding emissions from textile production. The primary environmental issue posed by the textile industry is the quantity of water that is released and the chemical load of this water. Emissions to water are often amassed at source. The characteristics of the waste water depend on a complex combination of factors such as the type of fibre, wet processing, production techniques and the chemicals and auxiliary chemicals used.

A large proportion of the total emissions from the textile industry derive from substances contained in the raw material as it enters the dressing plant (impurities and associated materials in natural fibres, finishing agents, spinning lubricants, adhesives, etc.). All these substances are generally removed from the fibre during pre-treatment prior to dyeing and finishing. Removing auxiliary agents, such as spinning lubricants, knitting lubricants and finishing agents, through wet processing can result in emissions of environmentally persistent substances (e.g. mineral oils) and dangerous compounds (e.g. polyaromatic

hydrocarbons, alkylphenolethoxylates (APEO) and biocides). The COD load associated with oxygen consuming organic substances is in general 40-80 g/kg fibre. The washing water from desizing of cotton and cotton-mix weaves can contribute to 70% of the total COD load in the final waste water. The emission factor can be as high as 95 g COD/kg textile.

The contribution from auxiliary dyeing agents (e.g. dispersants and setting agents) to the COD is particularly significant for dyeing processes that use disperse dyes. Since emissions from wet textile processes account for a large proportion of the environmental impact from textile production, the criteria include this requirement. The requirement on wet processes is stipulated in order to enable local industries to be used and with regard to the possible environmental benefits during textile production. Particularly with regard to textiles, which are often produced in less developed countries with poor waste water treatment, large environmental benefits may accrue if industries in the third world are stimulated to comply with Nordic Ecolabel requirements. The emission requirement applies to wet textile processes, which are processes that produce waste water. This is a new requirement in the criteria.

**Energy and water consumption**

There is often great potential in the field of textile manufacturing for energy savings using a heat exchanger, recirculation or similar.

Nordic Ecolabelling has not, for this revision, investigated this matter in relation to the manufacturing of supplies for microfibre based cleaning. Nordic Ecolabelling has, similarly, not prepared background material for specifying requirements in regard to water and energy consumption. The potential for stipulating requirements in respect of energy and water consumption may be assessed in the next revision of the criteria.

### 1.2.3 Textile quality (R20-R21)

The requirements apply to the dyed yarn, the dyed cloth or the finished product. Where applicable, analyses shall be performed.

Cloths and mops containing microfibre must also meet quality requirements in respect of colour fastness and dimensional changes. Since microfibre cloths and mops must be washable in water, requirements are specified in relation to colourfastness. Colourfastness is an important quality parameter that influences the use and washing of the dyed product. The requirement is stipulated in relation to colourfastness to washing, which is considered most relevant for the product group.

Colourfastness to washing shall at a minimum be level 3-4 for change in colour and at least level 3-4 for staining. This requirement does not apply to uncoloured and/or white products. Other requirements, such as colourfastness to water and colourfastness to dry or wet rubbing have also been evaluated during the criteria revision. These requirements have been omitted since the requirement on colourfastness to washing was considered the most relevant for this product group.

Since cloths and mops contain various types of fibre, including natural fibres, dimensional changes during washing must be checked. Dimensional change is an important quality parameter that influences the use of microfibre mops in particular. Mops must fit the utensils even after repeated washing.

This is a new requirement in this version of the criteria.

## 1.3 Other materials

The scope of the requirements extends to cleaning utensils such as mop handles, mop holders and other fixtures that are included as a constituent part of supplies for microfibre based cleaning. These cleaning utensils, composed in the main of plastic and metal, are not eligible for separate ecolabelling, but must fulfil requirements in regard to constituent materials if these are sold together with cloths and mops.

The criteria also apply to materials such as plastics and metals as well as chemical products and additives used for the pre-treatment and surface treatment of metals, as additives in plastics and for bonding.

#### Material composition (R22)

The parts of a cleaning utensil are sorted into different materials through a specification of the weight of each part/material. Small parts, such as screws, hinges, pins and so on, as well as other parts weighing less than 5g, are not subject to the requirement.
Such small parts that are exempted from the requirements specified in section 1.3 must not comprise more than 5% of the total weight of the product. A cleaning utensil must not contain more than 10% by weight of such material. This is a new requirement in this version of the criteria.

### 1.3 1 Chemical products (R23-R26 and R33)

The requirements apply to chemical products and additives used for the pre-treatment and surface treatment of metals (e.g. coatings), as additives in plastics and for bonding.

This is a new requirement. It is harmonised with Nordic Ecolabelling requirements for furniture and fitments, version 4.0. However, the requirements on the majority of materials in microfibre cloths and mops are considered to be supporting requirements in comparison to the primary textile requirements, which relate to the products primary function. Thus, this harmonisation does not entail that all of the Nordic Ecolabelling requirements on furniture and fitments need apply. In light of this, requirements on chemical products classified as R59, R39, R49 and R43 have been omitted.

#### Production chemicals (R23)

In accordance with requirement R10, the applicant must give a report of all production chemicals and products, providing documentation in respect of the product's complete name, safety data sheet, function, supplier and process in which it has been used. This is in order to ensure that all relevant chemicals are documented. Nordic Ecolabelling requires that safety data sheets are provided together with applications for purposes of the evaluation of declarations.

This is a new requirement in the criteria.

#### Ecolabelled chemical products (R24)

It is unnecessary to demonstrate fulfilment of the requirements (R25 and R26) under Section 1.3.1 for chemical products that carry the Nordic Ecolabel or the EU Eco-label as they are already in compliance with these requirements. This means that use of

ecolabelled chemical products, such as adhesives, is rewarded in the production of Nordic Ecolabelled supplies for microfibre based cleaning.

This is a new requirement in this version of the criteria.

**Classification of chemical products (R25)**

The term chemical products refers to the products in the form in which they are purchased, since this is the form in which they are handled by workers. A large number of additives and chemical products are used for the pre-treatment and surface treatment of metals. These products contain varying amounts of substances that are classified as environmentally dangerous and/or harmful. The most serious health aspects are associated with substances that are acutely toxic and substances with long-term effects, such as substances that are carcinogenic, mutagenic and toxic to reproduction.

Another serious aspect, which is primarily associated with the use of chemical products, is sensitisation. Regarding environmental aspects, particular consideration must be taken in regard to both substances that have acute toxicity and those that are bioaccumulating or not readily biodegradable. The requirement specifies which hazard classes and risk phrases that are prohibited in the production of Nordic Ecolabelled microfibre cloths and mops.

Products classified as a danger to the environment, very toxic, toxic, carcinogenic, reproduction toxic or mutagenic are prohibited. The criteria require a material safety data sheet with sufficient environmental and health information for all chemical products used in the pre-treatment and surface treatment of metals (e.g. coatings) and as additives in plastics and adhesives.

The reason for this change is that a material safety data sheet is a well-known and recognised method in industry of recording environmental and health hazards. Both the Dangerous Substances Directive 67/548/EEC (EU, 1967) and the CLP Regulation 1272/2008 (EU, 2008) are cited since the CLP Regulation comes into force during the validity period of the criteria. Directive 67/548/EEC will be phased out successively.

This is a new requirement in the criteria. The requirement on the classification of products has been adapted to the Global Harmonized System of the Classification and Labelling of Chemicals (GHS) in these criteria.

**Additives in chemical products (R26 and R33)**

The following substances are prohibited from use in chemical products and additives used in the pre-treatment and surface treatment of metals (e.g. coatings) and as additives in plastics and adhesives: halogenated organic compounds*; phthalates, aziridine and polyaziridines; alkylphenols, alkylphenolethoxylates (APEO) or other alkylphenol derivatives; pigments and additives based on lead, tin, cadmium, chromium VI and mercury or their compounds. The current criteria also contain requirements on additives in chemical products with the intention of prohibiting the use of the chemical substances that are the most hazardous to health and the environment in surface treatment (such as heavy metals and other dangerous substances).

This is a new requirement and is harmonised with the criteria for furniture and fixtures, version 4.0, but with a more restricted scope. Section 1.2.2 regarding processes and

chemicals specifies requirements on the contents of chemical products and is therefore not included in the requirement.

*Note the national legislations concerning PFOA in the Nordic countries. In Norway PFOA is regulated in «Forskrift om begrensning i bruk av helse- og miljøfarlige kjemikalier og andre produkter (produktforskriften)», §2- 32.*

### 1.3.2 Metals (R27-R29)

Metals are used in the composition of cleaning utensils sold together with cloths and mops, for example mop holders and mop handles. The proportion of metal varies between utensils. Metals in a product must be separable from the other materials (surface treatment exempt) without the use of special tools. This is to facilitate the handling of this waste fraction. Utensils that are sold along with mops or cloths must not inhibit waste processing.

This requirement is new and is harmonised with the requirements on material recycling in the criteria for furniture and fitments, version 4.0.

The current criteria also contain requirements on metal coatings, with the intention of prohibiting the use of chemical substances that are most hazardous to health and the environment in surface treatment (such as heavy metals and other dangerous substances).

Metals shall not be coated with cadmium, chromium, nickel, zinc or compounds of these. Cadmium is a very toxic heavy metal and its use in ecolabelled products cannot be justified.

During the review, it was found that recycled aluminium is used in cleaning utensils, such as mop handles and mop holders. Accordingly, the criteria contain a requirement on the proportion of recycled aluminium. This is considered important from the perspective of resource and energy conservation as well as emissions.

This requirement is new and is harmonised with the requirements on material recycling in the criteria for furniture and fitments, version 4.0.

### 1.3.3 Plastics (R30-R32 and R34)

Plastics must be marked to facilitate recycling. Nordic Ecolabelling wishes to require that non-renewable materials are recycled. This requirement prevents the use of plastic materials that can present problems during manufacturing and incineration.

If a product is comprised of a large proportion of plastic, it is required that recycled plastic is used in the product. Recycled plastic refers to plastic that has been recovered from a product at the end of its service life. Waste from production is not classified as recycled plastic. Plastics are non-renewable, which means that the raw material will not regenerate within a foreseeable future. The availability of the raw material declines as the raw materials are consumed. Design for reuse and recycling are beneficial design concepts.

During the review, it was found that recycled plastic is used in cleaning utensils, such as mop handles and mop holders. Accordingly, the criteria contain a requirement on the proportion of recycled plastic. This is considered important from the perspective of resource and energy conservation as well as emissions.

Further, the use of PVC and other halogenated plastics is prohibited in associated cleaning utensils and fixtures. During the criteria revision it was found that PVC plastics are used in some cleaning utensils such as mop holders. Accordingly, the project group has chosen to include this requirement in the criteria. When incinerated, PVC produces very toxic chlorinated hydrocarbons (due to the chlorine content of the plastic) which in turn form dioxins. The quantity of halogenated dioxins that forms also depends on the temperature of combustion. Further, stabilisers, plasticisers and flame retardants are also released during incineration. Many of these are hazardous to health and the environment. This requirement is new and is harmonised with the requirements on material recycling in the criteria for furniture and fitments, proposed version 4.0.

# 2 Functional requirements

Functional requirements cover the cleaning properties of the microfibre cloth or mop, such as the removal of dust and dirt and the reduction of micro-organisms.

Cleaning performance is central to the product group and a vital environmental parameter, leading to a continual growth in the use of microfibre cleaning products. Microfibres help reduce the use of cleaning chemicals and water. Accordingly, the criteria require that cloths and mops offer high cleaning performance both regarding the removal of dust and dirt and the reduction of micro-organisms.

In addition, properties such as abrasion and durability fall within the scope of the requirements.

#### Removal of dust and dirt (R35)

It must be demonstrated that cloths containing microfibre remove at least 85% of dust and dirt and microfibre mops at least 70%, following a number of washes and without the use of cleaning chemicals.

If a cloth or mop is designed for both wet and dry use, its performance regarding dust and dirt removal must be documented for both applications. This requirement is harmonised with the previous version of the criteria for microfibre products. The requirement levels have been evaluated and are considered to be sufficient and to have worked well. The updated criteria therefore stipulate the same requirement levels.

Cloths and mops containing microfibre generally offer good cleaning performance. Investigations have shown that a small deterioration to the cleaning performance of some microfibre products can result from a number of washes. According to information received by Nordic Ecolabelling in connection with the revision, certain products are pre-treated with chemicals in order to improve performance, such as with salts/absorbers that improve absorption. This performance diminishes with each wash as the chemicals are washed out. The performance of the product can deteriorate considerably. To ensure that the unique properties of microfibre do not diminish following washing, it is proposed that cleaning performance is tested following a number of washes to demonstrate the product's optimum service life (of acceptable function) during a period of use of at least one year. According to information received during the revision period, consumers wash products considerably less often than professional users (50-100 times/year compared to 200+ times/year). This is since professional products are used in significantly dirtier environments than those products aimed at the domestic consumer.

In light of the above, the project group proposed specifying that the cleaning performance of the products be tested following 50 washes and 200 washes respectively.

Following further investigation, Nordic Ecolabelling has received information that, in most cases, the performance of products increases after approximately three washes, which is due to the washing out of production chemicals at the same time as the effects of splitting remain intact. In some cases a dramatic deterioration in performance may occur after a few washes. Major reductions in cleaning performance may occur after approximately fifty washes; fibres are mechanically damaged as some of the fibres are washed out, leading to an imbalance in the product's construction.

Subsequently, Nordic Ecolabelling has chosen to adjust the proposal so that cleaning performance is assessed following a number of washes representing an average for an acceptable function equivalent to a period of use of at least one year.

Following adjustment, domestic products are to be tested after 10 washes, and products intended for professional users are to be tested after 50 washes. Domestic products are used in cleaner environments and are washed far less often than professional products. The limits have, therefore, been adapted to each type of product, and with the sole intention of demonstrating that cleaning performance is retained following treatment. Requirement R41 in the proposed revision to the criteria regulates the manufacturers guarantee regarding the number of washes after which a product should be able to retain cleaning performance.

In light of the above, the number of washes required in these criteria differs for consumer and professional products.

Consumer products shall be tested after 10 washes at 60°C while professional products shall be tested following at least 50 washes at 60°C.

The number of washes is equivalent to the average number of washes during one year of use consistent with retention of an acceptable level of performance.

Nordic Ecolabelling believes that a fact-based controlled test, instead of a declaration, will ensure that the product meets the requirements, without leading to a reduction in credibility. The performance of the product is to be demonstrated by rigorous testing, thus avoiding the use of unverifiable declarations. It has been discussed whether tests should be performed on products that have been used for a period of one year. However, the manufacturer/supplier is unable to verify use (especially consumer use) and there is a risk that the manufacturer's/supplier's recommendations are not followed. As a result, Nordic Ecolabelling has chosen to implement testing on new products. Consequently, no changes to the specified limits are proposed, but it is proposed that testing be performed on new products following the appropriate number of washes and without the use of cleaning agents.

The limit value in version 1.0 of 99% for hygiene requirements is good in theory, but there is uncertainty as to the definition of the term hygiene. The term "hygiene" should be clarified and exemplified; for example, if the term refers to operating theatre, hospital stairways or corridors. Such clarification is, however, difficult to achieve as levels of

hygiene required in these examples vary. Due to the ambiguous definition of hygienic conditions in the current criteria, the current specification of requirements in regard to dust and dirt reduction for products designed for hygienic requirements has been omitted. However, a separate requirement in relation to assessment of hygienic conditions (measuring reductions in quantities of micro-organisms) is stipulated. This requirement applies to products marketed as possessing the ability to reduce quantities of micro-organisms under various conditions.

There are currently few test methods that provide an objective evaluation of cleaning performance. A subjective, visual evaluation is still the most common. Methods used differ greatly and few are standardised. The areas of use for cloths and mops are wide and finding a standardised method is difficult.

The Nordic cleaning standard "INSTA 800" or the European standard "EN 13 549 Cleaning services Basic requirements and recommendations for quality measuring systems" may, for example, be used as a starting point for designing tests. In order to allow for a certain degree of flexibility regarding this issue, the following text has been added to section 2 on Functional requirements: Testing of functionality may be performed in accordance with the stipulations of the documentation requirements in R35-38. Alternatively, functionality testing may be documented according to the guidelines for cleaning of surfaces set out in Table 521 of Building Research Design Guide 700.209 "Prinsipper for miljøbevisst renhold - Beste Praksis Renhold" ("Principles for environmentally conscious cleaning - Best Practice Cleaning").

Standards such as SS 627801:2006 (equivalent to INSTA 800) describe a measurement procedure that is based on visual inspection and that can be used for all types of buildings and premises, irrespective of cleaning method and frequency. Using this measurement procedure, the expected quality of cleaning can be unambiguously defined and the quality of the cleaning that is performed can be evaluated. The standard also contains an in-depth description of various methods for evaluating cleaning quality using test instruments. The standard is widely used in the Nordic area and has been shown to facilitate the relationship between customers and service suppliers.

Measurements are performed to gain an objective evaluation of the quantity of dust and micro-organisms on all types of hard and semi-hard floors and equivalent horizontal surfaces. Other test methods may also be used if the recommendations in Appendix 2 are followed.

The requirement is intended to demonstrate that cleaning properties remain effective after this treatment – the number of washes that the product should be able to withstand if the manufacturers recommendations are followed is regulated in accordance with R51 Instructions.

**Assessment of hygienic conditions (measurement of quantities of micro-organisms) (R36)**

It must be demonstrated that cloths and mops containing microfibre reduce the amount of micro-organisms by at least 85% for cloths, and at least 70% for mops after a certain number of washes, (cfu=colony forming units). If a cloth or mop is designed for both wet and dry use, its performance regarding micro-organism reduction must be documented for both applications. This requirement applies only to products marketed as possessing the ability to reduce the presence of micro-organisms under various

conditions. The purpose of testing is to check that the result of cleaning of surfaces is acceptable in terms of hygiene requirements.

Satisfactory cleaning is important to prevent allergies and for other health issues. Dust comprises a mix of particles arising from larger objects. Dust contains particles from the surrounding environment, and may, for instance, contain mites and bacteria. Dust forms a layer on furniture and other indoor objects. This layer becomes thicker over time in the absence of cleaning. It is important for the indoor climate to restrict quantities of dust and micro-organisms to a low level. Accordingly, the removal of dust and dirt and reduction of bacteria are two of the most important parameters in assessing cleaning quality.

Measurement of quantities of micro-organisms may be performed using different growth substrates. Results may be presented in terms of the individual levels of the most common micro-organisms or as a total quantity of micro-organisms for a certain area (25 $cm^2$). Micro-organisms are often cultivated from samples taken from a variety of cleaned surfaces to determine either the quantity or types of micro-organisms present. Cultivation must take place at the correct temperature. The majority of pathogenic micro-organisms grow best at 37°C, but there are micro-organisms that grow at temperatures as high as 80°C and as low as 4°C. Micro-organisms must also have access to the right nutrients. Micro-organisms are most often cultivated in Petri dishes with agar nutrient. There are several different quality levels for the measurement of vibrio on surfaces, based on guidelines for cleaned surfaces. Hygiene measurements are carried out according to agreement with partners. Such agreements, dealing with requirement levels, measurement frequency and measurement objects, vary according to the type of activities or operations involved, but are always collated under one term – "Hygiene requirements". Information collected by the project group, in connection with the revision, suggests that cloths and mops containing microfibre are capable of reducing levels of micro-organisms by a relatively large amount when used without chemicals (up to 99%). Such cleaning performance can, however, vary depending on the type of surface to be cleaned and the cleaning methods applied (wet and dry). When cloths for wet and dry use have been tested on different types of surface, a significant difference in the reduction achieved by each cloth has been demonstrated between dry and wet used as well as in relation to the type of test surface : wood or laminate. Reductions of between 48–100% have been noted in the case of laminate surfaces, and between 59–99% for lacquered wood surfaces. The results of testing have also shown that one of two cloths has been more dependent on being used together with water for optimal performance in reducing the quantity of micro-organisms. The test recommendations in Appendix 1 of the proposed criteria state that reductions in quantities of micro-organisms achieved by cloths or mops that are used for both wet and dry cleaning should be documented for both applications. However, results of testing have shown that such reductions can vary greatly, and are dependent on final use and the properties of the cleaned area. In order to ensure that cloths and mops intended for both applications can perform optimally in reducing micro-organisms, and in order not to exclude products with combined functions, a requirement stipulating an optimal minimum has been specified in the proposals. The level is related to dust and dirt reduction, as the presence of micro-organisms is, as a rule, bound up with the presence of dust.

The project group has also taken into consideration a view expressed by a number of respondents that the costs of testing are too high. Such hygiene tests are relatively expensive, which may lead to rising costs for testing. The project group has, therefore, chosen to restrict the requirement on testing to those products that are marketed as

possessing the ability to reduce the presence of micro-organisms under various conditions. The requirement applies to products aimed at both the domestic and professional user. In this case, the burden of proof is placed on the supplier/manufacturer to demonstrate that the product fulfils the requirement of an optimal reduction in quantities of micro-organisms. Products that are not marketed in the way described above do not need to be tested.
In light of the above discussion, the project group believes that the proposed formulation of the requirement on reductions in the numbers of micro-organisms is optimally designed to reward those products on the market that meet higher standards of hygienic cleaning.

This is a new requirement in this version of the criteria.

**Abrasion (R37)**

A microfibre cloth or mop, when used as recommended, must not cause any type of damage to the cleaned surface.

Low abrasion is an important quality parameter for ecolabelled cloths and mops. The use of such products must not cause permanent damage to surfaces, and the manufacturer must provide a guarantee of this.

**Ergonomics**

Monotonous and strained working postures make cleaning a particularly high-risk occupation. Repetitive strain injuries can reduce an individual's ability to work and cause sick leave.

Subsequently, the project group has considered introducing a requirement stipulating that cleaning utensils be designed to facilitate ergonomic working postures and methods that reduce stress on muscles and joints. Ergonomics does not simply concern the design of the utensil but the interplay between the user and the utensil. It is vital that each utensil can, quickly and simply, be adapted to the optimum working posture for the task at hand. Several important parameters are considered, such as constituent materials and weight, friction, adjustment of holders and care of utensils.

Friction is an important working parameter. Microfibre cleaning products must not create significantly more friction than the most common cleaning products (in comparison with other microfibre products). Friction is influenced by several factors, such as the constitution of fibres, fibre thickness, the surface cleaned, and the intended cleaning method. This means that it is difficult to specify an exact coefficient of friction.

Consequently, manufacturers could be urged to specify how their supplies for microfibre based cleaning are developed to provide for ergonomic cleaning. The manufacturer should be able to describe how, for example, the mop handle is designed to offer optimum cleaning performance while also reducing strain during cleaning. The use of a well-designed mop handle can increase the area that can be cleaned by raising cleaning efficiency by 20-40%. This leads to fewer changes of mop.

As ergonomics is complex and manufacturers and suppliers have little control over how supplies for microfibre based cleaning are used, Nordic Ecolabelling has chosen not to present requirements in relation to ergonomics in these proposed criteria. The formulation of requirements in regard to ergonomics presents problems that are difficult

to resolve, but Nordic Ecolabelling retains the option of considering the issue further in future evaluations or revisions of the criteria.

Serious and credible operators in the industry prioritise working towards developing products and systems that meet all requirements, as well as educating users in the best ergonomic working methods. However, it remains to be seen how these requirements can be drafted in a satisfactory manner. Nordic Ecolabelling is able to review the issue again for the next revision of the criteria.

**Absorption (R37)**

It has been discussed whether it is possible to set requirements on the degree of splitting in this version of the criteria. Degree of splitting is a measure of the effectiveness of fibre splitting and is used by manufacturers for process control. According to information submitted to the project group, the degree of splitting should generally exceed 70%. The degree of splitting varies depending on the method of splitting used in each case.

Stipulating requirements in relation to splitting has, in this revision, proven difficult as:

- Splitting is uneven across the surface of the product which may lead to an inaccurate assessment of the degree of splitting.
- There is no standard method to assess the degree of splitting.
- Measurement is at microscopic level, i.e. the fibre structure is evaluated using a microscope.
- The degree of splitting is measured regularly by the supplier, however not more than once or twice a year.
- Measurement is very costly.
- Splitting is a "living" process that continues after production, such as during washing.

The degree of splitting influences the properties of the final product, such as its cleaning performance and absorption. This means that splitting can be measured indirectly through absorption, which is an important functional parameter of the microfibre.

Absorption tests are performed during production, as a type of quality control. This means it is reasonable to set requirements on absorption. The textile is knitted or woven and then set for splitting and dyeing, which is carried out in the same bath. Thus the requirement can only apply to the microfibre weave and not the final product, as this contains other materials.

Nordic Ecolabelling is aware that various products are available on the market in terms of choosing material and constructions in order to improve the properties of the final supplies for microfibre based cleaning when used according to recommendations. Consequently, Nordic Ecolabelling specifies requirements on absorptive powers in this proposal. Such requirements apply to products marketed for areas of use which require high powers of absorption, i.e. able to absorb at least 2.5 times their own weight.

In order to ensure that the absorptive powers of the final product arise mainly from microfibre, a test is to be carried out on newly produced microfibre textiles. This test is not to be performed on the final supplies for microfibre based cleaning, in which other materials with absorptive powers may be present. If microfibres with good absorptive powers are used in the product, the need to use other types of material is reduced. This

leads to a use of fewer materials and less energy in connection with manufacturing and final disposal: fewer fibres, i.e. a simpler construction, lead to fewer resources being "used-up". It is the responsibility of the manufacturer to produce a product that works well and can demonstrate possession of both absorptive and cleaning powers, i.e. choose how large a proportion by weight of microfibre the product is to contain, where these are to be placed in the construction and which types of microfibre are to be used in the product. The manufacturer also considers whether there is reason to use other materials – for instance as a way of keeping the construction upright. The most important factor for Nordic Ecolabelling is that the best microfibres, those which fulfil the requirements, are available for use. The term "best" here refers to microfibres with good functional properties, with good capacity for dirt removal and absorption if such qualities are required. This requirement only applies to products marketed as possessing high absorptive powers in use, for example in damp and wet cleaning.

This is a new requirement in this version of the criteria.

# 3 General requirements

## 3.1 Packaging (R39-R40)

The aim of this requirement is to make sorting and recycling of packaging simpler when the product is taken into use.

The second requirement concerns PVC and other halogenated plastics that must not be used for packaging or labels. This requirement prevents the use of plastic materials that can be problematic during manufacturing and incineration. When incinerated, PVC produces very toxic chlorinated hydrocarbons (due to the chlorine content of the plastic), which in turn form dioxins. The quantity of halogenated dioxins generated also depends on the temperature of combustion. Stabilisers, plasticisers and flame retardants are also released during incineration. Many of these are dangerous to health and the environment.

## 3.2 Instructions and labelling (R41-R42)

**Instructions (R41)**

The instructions shall contain:

- Information on the surfaces for which the product is designed.
- Information on correct use without cleaning chemicals.
- Statement of guaranteed service life (number of times that the product may be washed without impairing function) when used according to recommendations.
- Laundry instructions with directions regarding care, as well as recommended and maximum washing temperatures. For products that are not marketed for uses for which special hygiene requirements apply, laundry instructions shall contain the following text (or equivalent):
    - Lower washing temperatures help protect the environment
    - Wash with a suitable washing powder at 60°C and at maximum washing temperatures as necessary

Cloths and mops containing microfibre are to be used on recommended surfaces to achieve the best cleaning results without causing permanent damage to the surface.

Accordingly, it is vital that the supplier provides complete information about the surfaces for which the product is intended.

Clear washing and care instructions are to be provided with ecolabelled cloths and mops containing microfibre. This requirement is intended to make it easier to use and care for supplies for microfibre based cleaning in accordance with the manufacturer's recommendations. For example, no fabric softeners or bleaching agents shall be used when washing microfibre products since these can impair cleaning performance. The products must not be mixed with other types of laundry that can shed fluff and thereby impair the cleaning effectiveness of the microfibre product.

It must be possible to wash cloths and mops containing microfibre under conditions that allow the product to retain its cleaning performance over a long period of time. Following consultation, the project group has also taken account of the view that washing recommendations and requirements regarding washing properties should be considered separately, by requiring specific instructions in regard to both recommended and maximum temperatures. It must be possible for products intended for hygienic conditions, which require washing at significantly higher temperatures, to be washed at those higher temperatures in order to avoid misleading customers.

In order to take into consideration possible energy savings in relation to washing, Nordic Ecolabelling has chosen to stipulate requirements in regard to products that are not marketed as intended for particular hygienic conditions by urging washing of these at 60°C and at maximum temperatures as required.

The end user must be furnished with information that cloths and mops should be used without cleaning chemicals to guarantee the benefits of using ecolabelled supplies for microfibre based cleaning.

We have learnt from the criteria revision that it is imperative to ensure high product performance and eliminate inferior products by setting requirements on cleaning performance following washing. Accordingly, the project group has chosen to reformulate the requirement on durability in these criteria, as specified above. According to the requirement, manufacturers and suppliers of cloths and mops containing microfibre must inform the customer of the optimum guaranteed service life of the product (number of times that the product may be washed without impairing function) when used according to the recommendations provided.

Durability is one of the most important environmental and quality parameters for ecolabelled microfibre cloths and mops. The manufacturer must provide a statement of the product's expected service life in the recommendations.

**Labelling (R42)**

Supplies for microfibre based cleaning shall be labelled so that they are easily identifiable and distinguishable from other fabric cleaning products. This requirement is set to make it easier for the user to distinguish microfibre cloths and mops from other fabric cleaning products, which in turn makes it easier to use and care for the product as recommended by the manufacturer and thus maintain its cleaning performance. No changes have been made from version 1.0.

# 4 Quality and regulatory requirements (R43-R51)

These requirements ensure that the holder of an ecolabelling licence is responsible for safety issues, the working environment, compliance with environmental legislation and fulfilment of terms and concessions at production facilities during the production of the ecolabelled product.
These requirements are included to ensure that the requirements of the ecolabelling criteria are upheld during the period of the licence. This section is standard to all Nordic Ecolabelling criteria.

These requirements ensure that the ecolabelled product is marketed in compliance with "Regulations for Nordic Ecolabelling of Products". This describes the design of the Nordic Ecolabel and specifies how it is to be placed on the product. The regulations also describe how the licensee may use the Nordic Ecolabel in other Nordic countries and the documentation necessary for registration.

The project group has considered stipulating a requirement that customers must be able to be informed of the fact that they are using Nordic Ecolabelled supplies for microfibre based cleaning and of what this means.

Requirements on customer information could be used to regulate how the licensee communicates the advantages of using an ecolabelled microfibre product. Following further investigation, the project group has chosen to remove this requirement on the grounds that requirements on instructions (R41) and labelling (R42) already ensure that the necessary information is communicated.

# Appendices

## Appendix 1 Analysis and inspection

This section describes how tests and analyses are performed, as well as specifying methods of testing. Inspection includes both inspections at the time of application and follow-up inspections. Analysis laboratories must fulfil the general requirements of standard: General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005) or have official GLP* status. In addition, information on test methods is to be provided.

**Good Laboratory Practice (GLP) embodies a set of principles that provides a framework within which laboratory studies are planned, performed, monitored, recorded, reported and archived. These studies are undertaken in order to generate data by which the hazards and risks to users, consumers and third parties can be assessed. GLP helps assure regulatory authorities that the data submitted are a true reflection of the results obtained during the study and can therefore be relied upon when making risk/safety assessments. GLP ensures the quality, integrity and reliability of safety data.*

GLP principles include:

- Organisation and Personnel
- Quality Assurance Program
- Test system facilities and facilities for test and reference items
- Equipments, reagents and Materials
- Test systems
- Test & reference items

- Standard operating procedures
- Reporting of results
- Archiving of Records and Reports

## Appendix 2 Function

Recommendations that apply to tests for dust and dirt removal and the reduction of bacteria are found in this appendix.

## Appendix 3 Declarations

The declarations in this appendix shall be used when applying for a Nordic Ecolabel licence for supplies for microfibre based cleaning, version 2.0.

## Appendix 4 Information on classifications

Information on classification for the transition to the Globally Harmonised System (GHS) is presented in this appendix.

## Appendix User testing

The Appendix was to be used in connection with applications for Nordic Ecolabelling licences for supplies for microfibre based cleaning, version 2.0, but has been removed from the criteria proposal as the project group has, following further investigation, chosen not to stipulate requirements in respect of ergonomics.

## Appendix 5 Marketing

Use this appendix when applying for a Nordic Ecolabel licence for supplies for microfibre based cleaning, version 2.0.

# 5 Changes from the previous version

The most important changes since version 10:

- Changes to definition and name of product group
- Introduction of requirements on textiles.
- Harmonisation with GHS/CLP classification.
- Introduction of requirements on metals.
- Introduction of requirements on plastics.
- Tightening/adjustment of functional requirements.
- New layout.

# 6 New criteria

In the next version of the criteria, the following items will be considered for review:

- Production requirements, including the splitting process (splitting process with the least environmental impact regarding rest products and energy consumption).
- The desirability and feasibility of placing requirements on energy and water consumption in regard to wet processing in textile manufacturing.
- The desirability and feasibility of stipulating requirements in regard to low washing temperatures.
- Minimising packaging.
- The desirability and feasibility of extending the criteria to encompass cleaning systems using pre-treated cleaning material

# 7 References

EU (2008a): CLP regulation 1272/2008/EC with subsequent amendments and adaptations. Official Journal of the European Union.

EU (1967): Dangerous substances directive, 67/548/EEC with subsequent amendments and adaptations

http://www.kemi.se/

Nordic environmental declaration for sheet metal, metal strapping, foil and aluminium profiles. Skanaluminium: Nordic environmental declaration, edition 1, 2000

http://www.sis.se/

http://www.oecd.org/department/0,3355,en_2649_34381_1_1_1_1_1,00.html

http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html

RAPPORT Triclosan, DEHP och klordan - samlad utvärdering av svenska miljöövervakningsdata, Swedish Environmental Protection Agency, 2007

Nordic Ecolabelling (2009b): Nanoteknologi. Note to NMN 17 March 2009

Nordic Ecolabelling (2008): Utvärdering av kriteriedokument Svanenmärkning av mikrofiberdukar och -moppar

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

PFOS-relaterade ämnen, Strategi för utfasning, Swedish Chemicals Inspectorate, 2004

Perfluorerade ämnen - användningen i Sverige, Swedish Chemicals Inspectorate, 2006

Nordic Ecolabelling (2003) Miljømerkning av Mikrofiberkluter og -mopper Bakgrunnsdokument til Versjon 1.0

http://www.oeko-tex.com/OekoTex100_PUBLIC/index.asp

Nanoteknik – stora risker med små partiklar? En kunskapssammanställning om risker med nanoteknik för hälsa och miljö, samt förslag till hur identifierade kunskapsluckor bör åtgärdas, Swedish Chemicals Inspectorate, 2007

MetVikan ErgoClean, Economics has always been the backbone in Vikans concept for effective, professional cleaning, 2009

Report, Case Study 2 – Whipps Cross Summary, Microbiology, JohnsonDiversey, 2009
Report, Case Study 2 – Whipps Cross Summary, Microbiology, JohnsonDiversey, 2009
Whipps Cross letter to JohnsonDiversey from Lone Sarosi, Deputy Director of Infection Prevention and Control, JohnsonDiversey, 2009
Field Evaluation of dust levels at Marks and Spencer stores during the trial of the Jonmaster Microfibre System and a range of JohnsonDiversey chemicals, Linda Loader and Karen Sleator, Technical Team UK, 2003

Test report Cert No 67106. Cleaning efficiency of different mop products and comparison with current standard reference products. Weber & Leucht GmbH, 2008

Temadag Gulv2006. Teknologisk Institutt Kompetanse

"Tørt er fortsatt best". Article in the journal "Renholdsnytt" no. 6, 2007

Miljöaspekter på golvvård. SNF – Swedish Society for Nature Conservation, 2006

Tekomo Byggnadskvalitet AB, 2003

Cleaning and floor care project, S:t Eriks upper secondary school, 1999

Cleaning methods with low chemical use – a comparison of cleaning methods at University Hospital in Lund, Sjukvården i Landskrona, Lund, Orup, Ann-Kristin Ekholm, 1998

ACT – Advanced Cleaning Techniques Field test concerning the capacity of ACT-mop to reduce the number of bacteria. Comparison between the mops and swabfabrics, as well as photo documentation of the analysis results

Tekomo Byggnadskvalitet AB, 1998

Actuelle tricot in Borås AV, Sweden. Laboratory test of ACT – multiuse mop with microfibres. The importance of disinfection compound for the efficiency of cleaning. Tekomo Byggnadskvalitet AB, 1997

ACT – Advanced Cleaning Techniques. Laboratory test to evaluate the capacity of ACT cloths to reduce bacterial contamination. Comparison between unused (unwashed) and used (washed several times) ACT cloths for cleaning fixtures and sanitary surfaces.

Tekomo Byggnadskvalitet AB, 1997

Test report for ACT mops, SP Technical Research Institute of Sweden, SP Report 1997

http://www.sustainablehospitals.org/PDF/tenreasonsmop.pdf

http://ec.europa.eu/environment/ecolabel/

http://circa.europa.eu/Public/irc/env/ippc_brefs/library?l=/translation_executive_2/textile_svdoc/_EN_1.0_&a=d

http://www.kemi.se/templates/PRIOframes.aspx?id=4045&gotopage=4088

Alexandersson, P. (2006) Miljöaspekter på golvvård, Swedish Society for Nature Conservation Stockholm, ISBN: 915587891-