

About Nordic Swan Ecolabel

Office and hobby supplies



Version 5.0 • date – date

CONSULTATION

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057 Office and hobby supplies, version 5.0, Date

Contact information

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

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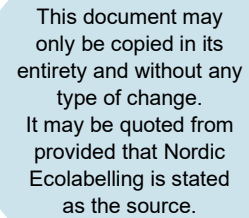
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1 Summary

The product group includes writing instruments, office supplies, paint, glue, tape and erasers for office and hobby, as described in the section "What can be Swan-labelled?".

The criteria set requirements for the materials in the product, the chemicals used in the product, quality of the product, consumer information and packaging.

Changes and updates from generation 4 to 5

The most important changes are described below.

See also overview of changes in section 5.

Product group definition:

The product type office supplies in monomaterials has been added, where the material must be wood, bamboo, wood fibres or plastic (one type of plastic). A ruler is an example of a product within this product type.

Structure of the criteria:

The structure has been changed so that it is more clear and logical, for example all requirements for packaging are now gathered in one section.

Refill requirements have been adjusted:

If refills are not offered for ballpoint pens, they must meet a longer writing length.

Requirements for the proportion of recycled plastic have been tightened:

The minimum proportion of recycled plastics has been increased from 30% to 60%. New requirement that recycled plastic must not come from facilities that are EFSA and FDA approved.

New requirement that recycled plastic must be tested for harmful substances.

New requirement for raw material for bio-based plastics.

Requirements for wood, bamboo, paper and cardboard have been updated and tightened:

The requirements have been updated to the latest version of the Nordic Ecolabelling forest requirements.

New requirement that reused/recycled parts of wood or bamboo must be untreated.

Requirements for chemicals have been updated and tightened:

Prohibited classifications of chemical products and ingoing substances have been updated and tightened.

Requirements for titanium dioxide (TiO₂) in specific products for children have been updated on the basis of the latest EU commission's SCEEER assessment in 2023 of the safety of using TiO₂ in toys.

Requirements for residual monomer in polymers have been updated regarding classifications.

Requirements for preservatives have been updated regarding classifications. Requirements for isothiazolinones regarding specific concentration limit and CLP have been added.

Requirements for the quality of the products have been updated and tightened:

Requirements for the writing length for rollerball and ballpoint pens are now divided into two levels, depending on whether refills are offered or not.

New requirement for durability/functionality after storage for ballpoint, rollerball, marker, felt and whiteboard pens.

New requirement for lead and coloured pencils to test that the lead does not break during sharpening.

New requirement for felt-tip and whiteboard pens regarding text on product about horizontal storage.

Requirements for packaging have been tightened:

New requirement that oxo-degradable plastics and biodegradable plastics may not be used.

New requirement that the packaging must be monomaterial, must be able to be recycled, consist of 100% recycled material or be FSC or PEFC certified.

New requirement for the packaging to be marked with pictograms for waste sorting.

2 Environmental impact of office and hobby supplies

The relevant environmental impacts found in the life cycle of office and hobby supplies are set out in the qualitative MECO scheme below. A MECO describes the key areas that have impact on the environment and health throughout the life cycle of the product – including consumption of materials/resources (M), energy (E), chemicals (C) and other impact areas (O).

It has not been possible to find relevant LCA studies for this product group. Instead, a qualitative MECO analysis has been made below based on materials and chemicals included in the product group as well as information on the product group's life cycle phases.

Table: MECO for writing instruments

	Raw material phase	Production phase		Use phase	Waste phase	Transport phase
		Materials	Product			
Material	<p>Crude oil: plastic granules, synthetic fibres, ink chemicals, glue, printing inks, oil chalk.</p> <p>Titanium Dioxide: Oil chalk, coloured pencils, etc.</p> <p>Kaolin: coloured chalk Graphite: pencils.</p> <p>Calcium carbonate: coloured chalk.</p> <p>Wax and Paraffins (crude oil/vegetable oils e.g. beeswax) in coloured chalk.</p> <p>Pigments in the form of metals and others.</p> <p>Wood raw material: shaft, paper casings and packaging paper and cardboard.</p> <p>Metals: brass, steel and aluminium.</p> <p>Rubber (both synthetic and natural): Erasers and parts of handles on writing instruments.</p> <p>Grain, straw, corn and other agricultural raw materials: bioplastic granules.</p>	<p>Crude oil and gas for the production of materials.</p> <p>Possibility of recycled raw materials/materials. For example, recycled paper.</p> <p>Reuse of material waste in production.</p>	<p>Crude oil and gas for the production of materials.</p> <p>Possibility of recycled raw materials/materials. For example, recycled paper.</p> <p>Reuse of material waste in production</p>	<p>Lifetime, quality in the use phase, avoidance of drying out.</p> <p>How the design affects whether all the ink/colour is consumed.</p> <p>Possibility of refill and information about this for the user.</p>	<p>Possible material recycling design can have an impact.</p>	<p>Fuel for distribution and material transport.</p>
Energy	<p>Extraction of raw materials such as crude oil, gas, titanium dioxide and metals.</p> <p>Production of agricultural raw materials.</p> <p>Production and drying of wood raw materials.</p>	<p>Production of plastic granules, paper pulp, metal processing and possibly surface treatment of product parts.</p> <p>Polymer manufacturing and production of additives, pigments and process chemicals.</p>	<p>Energy consumption during production.</p>	<p>Nothing.</p>	<p>No major relevance, plastic, wooden and paper parts contribute energy during burning.</p>	<p>Energy consumption when transporting raw materials and products.</p> <p>Product design/weight has an influence on transport load during distribution.</p>

Chemicals	Process chemicals and emissions to air during the extraction of crude oil refining, as well as during metal extraction.	Chemical exposure and release during the production of plastic granules, paper pulp, metal processing and possibly surface treatment of product parts. Chemical exposure and release in the manufacture of graphite, cardboard, glue, ink, pigments.	Process chemicals in product production (glue, ink) and in printing. Possibly, emission when printing. VOC consumption in production. Emissions from production.	Exposure (particularly relevant for children): Allergy and other health risks from skin contact with ink and possibly VOCs. Possibly, ingestion of ink and eye contact (irritation). Oral intake of surface treatment (pigment, binder) from pencil tips by chewing.	Emissions from burning. Heavy metals from metal parts and halogenated substances from pigment. Environmentally hazardous substances from pigments/inks that end up in recycled paper fibers recycled fiber when the written paper is recycled.	Maintenance chemicals such as lubricating oils, cleaning agent. Emission to air of PAH, CO ₂ , NO _x , SO _x , particulate matter etc.
Others	Sustainable wood and agricultural raw materials. Landuse. Social aspects of raw material extraction.	Social and ethical aspects.	Social and ethical aspects.	Writing and color quality. Communication and information about the product's health performance.		

Table: MECO for hobby paints

	Raw material phase	Production phase		Use phase	Waste phase	Transport phase
		Materials	Product			
Material	Paint: Crude oil: VOC, acrylic polymers. Pigments: metals and titanium dioxide. Packaging: Extraction of metals. Grain, straw, corn and other agricultural raw materials: bioplastic granules. Crude oil for fossil plastics	Crude oil and gas for the production of materials. Reuse of material waste in production.	Crude oil and gas for the production of materials. Reuse of material waste in production. Packaging: Possibility of recycled raw materials/materials. For example, recycled paper.	How the packaging affects whether all the paint is consumed. So that there is not too much left in the packaging.	Possible material recycling design can have an impact.	Fuel for distribution and material transport.
Energy	Paint: Extraction of raw materials such as crude oil, gas, titanium dioxide and metals. Packaging: Production of agricultural raw materials. Production and drying of wood raw materials.	Polymer manufacturing and production of additives and process chemicals.	Energy consumption during production.	Nothing.	No major relevance. Plastic packaging contribute energy during burning.	Energy consumption when transporting raw materials and products.

	Extraction of crude oil for plastics.					
Chemicals	<p>Process chemicals and emissions to air during the extraction of crude oil refining, as well as during metal extraction.</p> <p>Packaging: Fertilizer from agricultural and wood raw material production.</p>	<p>Chemical exposure and release during the production of acrylic polymers.</p> <p>Chemical exposure and release in the manufacture of pigments.</p> <p>Packaging: plastic granules, paper pulp.</p>	<p>Process chemicals in product production.</p> <p>Preservatives.</p> <p>VOC consumption in production.</p> <p>Emissions from production.</p>	<p>Exposure (particularly relevant for children): Allergy and other health risks (CRM-substances) from skin contact and possibly VOC (turpentine, xylene). Possibly, ingestion of paint and eye contact (irritation). Isothiazolinones and others as preservatives.</p>	<p>Emissions from burning and landfill - heavy metals from metal parts and halogenated substances from pigment.</p> <p>Environmentally hazardous substances from pigments that end up in recycled paper fibre recycled fibre when the written paper is recycled.</p>	<p>Maintenance chemicals such as lubricating oils, cleaning agent.</p> <p>Emission to air of PAH, CO₂, NO_x, SO_x, particulate matter etc.</p>
Others	<p>Packaging: Sustainable wood and agricultural raw materials.</p> <p>Landuse.</p>	<p>Social and ethical aspects.</p>	<p>Social and ethical aspects.</p>	<p>Quality and lifetime in the use phase.</p> <p>Communication and information about the product's health performance and storage.</p>		

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

RPS:

Lifecycle stages	Area and assessment of R, P, S (high, medium or low)	Comments
Raw materials		
Plastic	Plastic	<p>Plastic is often used in this product group.</p> <p>Plastic production is energy and resource intensive. This can be reduced by using recycled plastic.</p> <p>By setting requirements for the proportion of recycled plastic, the climate impact is reduced compared to virgin plastic. This is also the case with bio-based</p>
Metal	<p>R: High</p> <p>P: Medium</p> <p>S: Medium</p>	

Wood and bamboo Cardboard and paper		plastics, here it is also important that requirements are set for the bio-based raw materials to avoid burden shift. In addition to the products, plastic can also be used in the packaging.
	Metal R: High P: Medium S: Medium	Metal is used relatively often in this product group, but can, for example, be replaced by plastic in the casing of a ballpoint pen. Production of metal is more energy-intensive than production of plastic and wood, therefore it makes sense to limit the amount of metal in the products where metal can be replaced by other materials.
	Wood, bamboo, cardboard and paper R: High P: High S: High	High RPS for requirements for certified sustainable or recycled wood raw materials in solid wood and wood fibres. In addition to the products, cardboard can also be used in the packaging.
Production		
Chemicals harmful to the environment and health Energy consumption Emissions	Chemicals R: High P: High S: High	High RPS for requirements for the chemical product (e.g. ink, paint), where substances harmful to the environment and health should be avoided as far as possible.
	Energy consumption R: Medium P: Medium S: Low	Medium to low RPS for requirements for energy consumption during production of the products. The primary energy consumption is probably in the raw material phase, but knowledge of energy consumption in the production phase of the products is low and is also estimated to vary greatly depending on the specific product type. Therefore, no requirements are set for this area.
	Emissions R: Medium P: Low S: Low	Low RPS for requirements for emissions during production of the products. Emissions to water and air are considered to have less relevance for this product group. Therefore, no requirements are set for this area.
Use phase		
Quality and durability	Quality and durability R: High P: High S: Medium	High RPS for requirements for quality and durability of the products. Both a good quality and a good durability will mean that the consumer does not replace the products as often, thereby reducing the environmental impact.
End of life		
Recycling	Materials in the product R: Medium P: Low S: Low	Low RPS for requirements to promote that materials in the products are recycled, as the products are often composed of several material types, which are not easily separated. In addition, it is assessed that the probability that the end users will spend time separating and sorting all the material types and small parts for waste sorting is low. The product group also includes the product type "monomaterial office supplies", where the entire product consists of only one type of material. Here, the RPS is high in order to require that the materials can be recycled, and there are therefore requirements for this.
	Materials in the packaging R: High P: High S: Medium	High RPS for requirements that the packaging can be recycled.

3 Other labels

EcoMark

EcoMark is a Japanese ecolabel that, among other things, has criteria for office supplies and stationery. The criteria have a comprehensive product group definition, which i.a. includes writing implements, envelopes and notebooks. Here, demands are made for, among other things, proportion of recycled material, refill and chemicals.

Blue angel

Blue angel is the German ecolabel. Here, writing implements and stamps can be labelled under one set of criteria and artist colours under another set of criteria. For writing implements, there are i.a. requirements for the proportion of recycled material, refills, chemicals, quality and packaging. For artist colours, there are i.a. requirements for chemicals, quality and packaging.

Österreichisches Umweltzeichen / The Austrian Ecolabel

Österreichisches Umweltzeichen is the Austrian ecolabel. They have, among other things, criteria for office and school supplies. The criteria have a comprehensive product group definition, which i.a. includes writing implements, hobby paints, scissors, rulers, pencil sharpeners, hole punches. Here, demands are made for, among other things, proportion of recycled or renewable material, chemicals, refill and quality.

NF400 – NF Environment

For writing instruments, there is the French ecolabel NF400. Here, i.a. requirements for writing length and protection against drying out, as well as a ban on specific classifications of both ink and ingredients in the ink.

The A-label (A-mærket) in Denmark

The industry organisation, Fællesrådet for Formnings- & Hobbymaterialer (FFFH) is an association of manufacturers, importers and dealers of hobby materials in Denmark. FFFH has developed a labelling system called the A-label (A-mærket).

The overall purpose of the A-label is to make shaping and hobby materials that are not harmful to the health of children and young people visible. The A-label is the industry's own label and is therefore not a type I environmental label.

4 Justification of the requirements

This chapter presents new and revised requirements, explains the background to them, the chosen requirement levels and any changes compared with version 4. The appendices referred to are those that appear in the criteria document "Nordic Swan Ecolabelling of office and hobby supplies".

4.1 Definition of the product group

The product group includes writing instruments, office supplies, paint, glue, tape and erasers for office and hobby according to the following description:

- **Writing instruments:** Pencils, coloured pencils, refillable pencils, ballpoint pens, reservoir pens, overhead pens, whiteboard pens, highlighters, felt-tip pens, charcoal, ink and crayons.
- **Hobby paint:** Acrylic paint such as school paint and artist's colours, fresco, tempera, gouache, finger paint, watercolours, glass paint, textile paint, printing ink, airbrush paint and porcelain paint. Brushes may be included as an application component if they are sold together with the paint.
- **Office/hobby glue:** Such as universal glue, paper/school glue, glue sticks, glitter glue and other office and hobby glues that fulfil the criteria.
- **Tape (adhesive on a carrier material):** Office tape, packing tape, decorative tape, correction tape, double adhesive tape and photo tape with or without colour and/or print.
- **Erasers:** For office, school or hobby.
- **Other office supplies than described above:** Office supplies in monomaterials of wood, bamboo, wood fibres or plastic (one type of plastic). Examples of products are rulers, card holders, pen holders and others. Nordic Ecolabelling determines whether the product can be accepted as an office article and be labelled according to these criteria.

Refill systems for these products are also included. Application parts and dispensers that are not part of the product packaging can be included in the license if it does not weigh more than the product itself.

4.2 Definitions

Word	Definition
Products marketed to children	Products where it is signalled either on the product itself, the product packaging or other product information, either in the form of text or design, that the product is for children.
Primary packaging	Primary packaging means the packaging that accompanies the Nordic Swan labelled product to the customer or individual packaging that accompanies the product to retail. The container itself for the ink or glue, as well as the application part for e.g. tape, is not considered to be packaging, but to be a part of the product.
Chemical product	A chemical product is a finished product that contains chemical raw materials. A chemical product can be, e.g., ink, paint, graphite, crayons, chalk, varnish, foils for surface treatment, glue and other adhesives.
Ingoing substances	All substances in the chemical product regardless of amount, including additives (e.g., preservatives and stabilizers) in the raw materials. Substances known to be released from ingoing substances (e.g., formaldehyde, arylamine, in situ-generated preservatives) are also regarded as ingoing substances.
Impurities	Residuals, pollutants, contaminants etc. from production, incl. production of raw materials, that remain in the chemical product in concentrations less than 100 ppm (0,0100 w%). Impurities in the raw materials exceeding concentrations of 1000 ppm (0,1000 w%) are always regarded as ingoing substances, regardless of the concentration in /chemical product.

	Examples of impurities are residues of the following: residues or reagents incl. residues of monomers, catalysts, by-products, scavengers, and detergents for production equipment and carry-over from other or previous production lines.
Additives/additives in polymer	Chemical raw materials added to improve polymer performance, functionality and aging properties. Examples of additives are plasticizers, flame retardants, antioxidants, light/heat/thermal stabilizers, pigments, antistatic agents and acid removers.
Recycled material	<p>Recycled material is defined in the requirement according to ISO 14021, which applies the following two categories:</p> <p>“Pre-consumer/commercial” is defined as material that is recovered from the waste stream during a manufacturing process. Materials that are reworked or reground, or waste that has been produced in a process, and can be recycled within the same manufacturing process that generated it, are not considered to be pre-consumer recovered material.</p> <p>Nordic Ecolabelling considers reworked, reground or scrap material that cannot be recycled directly in the same process, but requires reprocessing (e.g., in the form of sorting, remelting, and granulating) before it can be recycled, to be pre-consumer/commercial material. This is irrespective of whether the processing is done in-house or externally.</p> <p>“Post-consumer/commercial” is defined as material generated by households or commercial, industrial, or institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose. This includes materials from the distribution chain.</p>
Monomaterial	<p>One material, e.g. bamboo, pine or one type of plastic, e.g. PP.</p> <p>However, components made from PP are allowed to have up to 5% PE if it comes from the masterbatch.</p> <p>Recycled plastic, which is bought as one type of polymer, e.g. PP, is considered monomaterial.</p>

4.3 Product description, refill and child safety

The products, the material composition, the manufacturing process, suppliers etc. must be described for e.g. to be able to assess which requirements must be met.

Information on refills and child safety must be disclosed.

O1 Product description

The applicant must provide the following information about each product:

- Trade name
- Product type (e.g. whiteboard pen, rollerball pen with gel ink, finger paint, etc.)
- Whether the product is marketed to children*.
- Whether the product is an office supply in monomaterial**.
- A description of the product, as well as the materials and chemical products*** included.
- If dispensers, application parts or other parts that come with the product are used, these must be included in the description and covered by the requirements.
- List of materials and chemical products*** included in the product, as well as in any dispensers, application parts or other parts that come with the product. For each material and chemical product, the list must

contain information on type (for material: e.g. pine, PE. For chemical product: e.g. ink, paint), percentage by weight (calculated separately for the total materials and for chemical product respectively) and suppliers.

- Description of the manufacturing process for the product. Subsuppliers must be described with company name, production site, contact person and which production processes are carried out (e.g. ink production).
- State whether the product is sold with or without primary packaging****.

* See definition of products marketed to children in section 4.2.

** See definition of monomaterial in section 4.2.

Nordic Ecolabelling determines whether the product can be accepted as an office supply and labelled according to these criteria.

*** See definition of chemical product in section 4.2.

**** See definition of primary packaging in section 4.2.

- Information, detailed description and list in relation to the above points. Feel free to use a flow diagram to describe the production process. Appendix 2 can be used.
- Product data sheet or equivalent for each material.
- Safety data sheet in English (or Scandinavian) for the chemical product in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC).

Background to requirement

It is important that this information is given correctly, as it is decisive for which requirements are relevant for the product. Therefore, the product must be described, and the ingredients, chemical product and manufacturing processes must be disclosed, as well as who are the suppliers of these. In addition, it must be stated whether primary packaging is used or not.

O2 Refill

The requirement applies to refillable pencils, ballpoint pens and tape.

The following requirements apply:

- Refillable pencils: Refill leads must be offered.
 - Ballpoint pens: Refill cartridges must be offered if the writing length in requirement O26 is below the requirement limits for "products without refill".
 - Refill cartridges must contain at least as much ink as the corresponding original cartridge.
 - Disposable dispensers for tape are not permitted. There must be a refill option, which is offered in the range.
- Declaration from the applicant that the requirement has been met as well as a description and photo showing the refill system.

Background to requirement

For both ballpoint pens and refillable pencils, manufacturers often offer a refill option. This extends the life of the writing instrument and minimizes the product's environmental impact compared to the functional unit. In the Nordic countries, however, refills for ballpoint pens are used to a lesser extent than in many other European countries. Therefore, it is possible for ballpoint pens, instead of refills, to have a longer writing length and thus the primary product (ballpoint pen) has a longer lifespan, see more in requirement O26.

The requirement requires a refill option for ballpoint pens and refillable pencils and not for felt-tip pens. Refilling felt-tip pens is more complicated if the ink is poured on. Refill cartridges for felt-tip pens are rarely used. It has therefore been assessed that it is not realistic that the consumer will use refills for felt-tip pens and instead the focus is on setting resource requirements in the form of requirements for recycled materials in the product. However, there are manufacturers of whiteboard markers who offer a refill option, but alternatively there are also whiteboard marker manufacturers who have instead focused on using renewable or recycled materials in the product. Both measures have been taken to reduce the consumption of fossil resources.

If the tape is sold incl. dispenser, it is required that there is an option to refill with new tape.

O3 Child safety

Products that are marketed as products for children must meet authority requirements for child safety as well as meet requirements for CE marking according to relevant parts of the standard for toy safety.

Declaration from the applicant.

Background to requirement

The authorities set extra requirements for children's products and the applicant must declare that these are met.

4.4 Materials in office supplies in monomaterials

Products in this category can be e.g., ruler, card holder, pen holder etc.

Nordic Ecolabelling determines whether the product can be accepted as an office article and labelled according to these criteria.

Office supplies in monomaterials must meet the requirements in this section, as well as other relevant sections and requirements in these criteria, e.g., a plastic product must meet the requirements in sections 4.3, 4.5, 4.9, 4.10 and 4.12.

O4 Permitted materials

Office supplies in monomaterials* must consist 100% of one of the materials:

- Tree
- Bamboo
- Wood fibres

- Plastic (one type of plastic)

Other materials are not permitted.

* *See definition of monomaterial in section 4.2.*

- Information from the manufacturer about the type of material, as well as a declaration that the product consists 100% of this material.

Background to requirement

The product must only consist of one material, which must either be plastic (one type of plastic), wood, bamboo or wood fibres. Meaning that the product must not e.g., consist of metal and must not be composed of several materials, such as wood and plastic, or several types of plastic.

By allowing office supplies in monomaterial, it is possible to label a number of products in a relatively simple way. As the products must consist of monomaterial, they can also be recycled in a high material quality.

4.5 Plastic and rubber

Requirement O5 and requirement O9 apply to all plastic parts (both virgin and recycled plastic) that comprise of more than 1% by weight in the finished product. Requirements O5 and requirements O10 apply to all rubber, regardless of the weight proportion in the product. The requirements include the product incl. containers, application parts and cases.

O5 Plastic types

Polyvinyl chloride (PVC), polyvinyl dichloride (PVDC) must not be included in the product.

Furthermore, for office supplies in monomaterials, biodegradable plastic, oxo-degradable plastic or plastic composite* must not be included in the product. However, Calcium Carbonate (CaCO₃) is permitted in the plastic in quantities so that the density of the plastic does not exceed 0.995 g/cm³.

* *Plastic composite is defined as plastic mixed with/added other substances or materials which are insoluble in the plastic and which disrupt/"contaminate" today's Nordic plastic recycling systems, e.g. wood fibres or bamboo.*

- Declaration from the manufacturer that the types of plastic, according to the requirement, are not included.

Background to requirement

The requirement is set to ensure that PVC (polyvinyl chloride) and PVDC (polyvinyl dichloride) are not included in the product and to provide an overview of which plastic types are included. PVC can be used as soft or hard PVC. PVDC is a type of PVC with double chlorine atoms.

In addition to the risk of harmful phthalates in the soft PVC, it is especially the waste treatment of PVC that is problematic.

Office supplies in monomaterials can be easily sorted and the material recycled, which is often not the case to the same extent for the other product types covered by these criteria. Therefore, specific requirements are set for office supplies in

monomaterials regarding that the materials must not contaminate and disturb the other plastic flows for recycled plastic in the Nordic region.

Oxo-degradable plastic is conventional plastic (e.g. PE) with additives (e.g. metal salts) which start a degradation of the plastic¹. Oxo -degradable and biodegradable plastics must not be used, as they contaminate and disrupt the other plastic streams for recycled plastic in the Nordics. Biodegradable plastic should not be confused with plastic based on biopolymers, regarding biopolymers see under requirement O8.

Nordic Ecolabelling here defines plastic composites as plastic mixed with/added other substances or materials² that are insoluble in the plastic³ and which disrupt/"contaminate" today's Nordic plastic recycling systems. The purpose of the requirement is to avoid plastic composites, which disrupt the plastic recycling processes used in the Nordics and which reduce the quality of the recycled plastic.

Plastic composites can cause problems in correctly identifying the type of plastic with the NIR technology. However, with low fractions of materials other than plastic the NIR technology can probably sort the plastic types correctly, but the plastic composites will still have a negative effect on the overall quality of the recycled plastic^{4,5}. Based on this, the plastic composites are not permitted, even if the fractions of other materials are low.

Calcium carbonate (CaCO₃, chalk) is allowed, as it does not significantly reduce the quality of the recycled plastic. But if calcium carbonate is added to the plastic in quantities so that it does not float in water, this plastic waste will sink into the sink- float separation plant, where waste plastic is sorted - and this plastic will therefore not be recirculated⁶. Therefore, calcium carbonate must only be added in quantities so that the density of the plastic does not exceed 0.995 g/cm³.

O6 Recycled plastic

Plastic materials that comprise more than 5% by weight in the product must meet the requirement. Products marketed to children are exempt from this requirement.

At least 60% by weight* of the plastic materials must be recycled**.

Recycled plastic from facilities that are EFSA*** or FDA*** approved for food contact or marketed as compatible with this may not be used.

The recycled plastic must also meet requirement O7.

* *Plastic from ink cartridges shall not be included in the calculation.*

** *See definition of recycled materials in section 4.2.*

¹ EU's plaststrategi: https://ec.europa.eu/denmark/news/eu-strategi-plastic_da

² Plastindustrien: [Komposit-plast | plast.dk](https://www.komposit-plast.dk)

³ Store Norske Leksikon: [plastkompositter – Store norske leksikon \(snl.no\)](https://www.snl.no/plastkompositter)

⁴ <https://plast.dk/wp-content/uploads/2019/12/Designguide-Genbrug-og-genanvendelse-af-plastemballager-til-de-private-forbrugere-online-version.pdf>

⁵ Dialog med to nordiske plastrecirkuleringsanlæg, 2020.

⁶ [The Association of Plastics Recyclers | HDPE Design Guidance \(plasticsrecycling.org\)](https://www.plasticsrecycling.org/)

**** According to the EU Commission's Regulation (EC) No. 282/2008 of 27 March 2008 on materials and articles made of recycled plastic intended for contact with food.*

**** According to Code of Federal Regulations Title 21: Food and Drugs, Part 177 - Indirect food additives: polymers.*

- Information on plastic type(s) and weight % of recycled material.
 - Declaration from the manufacturer of recycled raw material that the raw material is not EFSA or FDA approved, cf. the requirement.
 - Documentation that recycled raw material is certified with EUCertPlast , RecyClass , Global Recycling Standard or Recycled Claim Standard.
- or
- Declaration from the manufacturer of the plastic that it is recycled. In addition, the manufacturer must disclose the primary sources of the recycled plastic (e.g. collected consumer packaging, residual waste from the manufacturer of xx product), as well as disclose the proportion of pre -consumer/commercial and/or post-consumer/commercial recycled plastic.

Background to requirement

Considerable environmental potential is expected in the future in terms of reduced resource consumption and CO₂-emissions if plastic waste can be converted into new raw materials for use in products. Nordic Ecolabelling wants to stimulate an increased use of recycled material in production and thereby avoid the use of virgin fossil materials.

Prohibition of the use of regranulates resulting from reprocessing processes that have obtained approval under Commission Regulation (EC) No. 282/2008 on recycled plastic materials and articles intended for contact with food or approval under the Code of Federal Regulations Title 21: Food and Drugs, Part 177 - Indirect food additives: Polymers. These are both approvals for the material to be used in contact with food. It is not desirable to use processed, recycled raw materials that are approved for food packaging production. Plastic materials approved for food packaging require the highest traceability and purity of the plastic raw material, and it would therefore be down-cycling to use this plastic for anything other than food contact products.

The requirement states that the raw materials used in the recycled raw material must be traceable. Without traceability, it is difficult to ensure that the material is actually recycled. Traceability can be documented with a certificate from a third-party certifier of the supply chain, such as Global Recycled Standard. The Global Recycled Standard (GRS) is an international, voluntary standard that requires third-party certification of recycled content and traceability in the supply chain. Alternatively, traceability can be documented by the manufacturer of the recycled raw material declaring that 100% recycled raw materials have been used.

Children are more sensitive to substances harmful to health. In recycled plastic, there is less control over the content of substances harmful to health than there is in virgin plastic. In requirement O7, the recycled plastic must be tested for the

content of the most likely harmful substances, however, one still cannot be sure that the recycled plastic is 100% free of harmful substances. Based on this, there is no requirement for products for children to meet requirements for the proportion of recycled plastic.

07 Recycled plastics: Test for harmful substances

Recycled plastics must not contain the following substances above the limits specified in the table below.

The requirement must be documented with either a) or b):

- a) A test report showing that the requirement is met.
- b) An Oeko-Tex Standard 100 class II certificate.

The requirement must be documented when applying, as well as if any change after application of supplier of recycled plastic, significant changes to the sources of the recycled plastic or similar.

The following are exempt from this requirement:

- Material from PET bottles originally approved for contact with food.
- Plastic from chemically recycled polymers, if it can be documented that the process ensures that the requirement limits are met.

Substance/substance group	Max. limit	Test method
Extractable metals		Atomic Absorption Spectrometry (AAS) or ICP. The metals are extracted using an artificial acidic sweat solution according to ISO 105-04 (test solution II).
Total chrome	2.0 mg/kg	
Lead	1.0 mg/kg	
Mercury	0.02 mg/kg	
Cadmium	0.1 mg/kg	
Antimony	30.0 mg/kg	
Phthalates		Extraction of the sample material with an organic solvent. The extract is analysed by gas chromatography (MS detection).
BBP, DBP, DEP, DMP, DEHP, DMEP, DIHP, DHNUP, DCHP, DHxP, DIBP, DIHxP, DIOP, DINP, DIDP, DPrP, DHP, DNOP, DNP and DPP	A total of 0.05% by weight	
PAHs (polycyclic aromatic hydrocarbons)		Extraction of the sample material with an organic solvent. The extract is analyzed after purification by gas chromatography with mass selective detection (MSD).
Naphthalene, acenaphthene, acenaphthylene, phenanthrene, anthracene, fluorene, fluoranthene and pyrene	Each 1 mg/kg	
Flame retardants		Extraction of the sample material with an organic solvent. The extract is then

		analyzed by LC/MS/MS and GC/MS/MS respectively.
Brominated and chlorinated flame retardants	A total of 50 mg/kg	
Dyes		
Carcinogenic aromatic amines listed in Appendix 3.	A total of 20 mg/kg	EN 14362-1 EN 14362-3

- ☒ Test reports or Oeko-Tex standard 100 class II certificate showing that the requirement is met. As well as a written routine that shows how it is assessed when a new test or Oeko-Tex certification is assessed as necessary.
- ☒ When using chemically recycled polymer, there must be documentation showing that the recycling process ensures compliance with the requirement.
- ☒ When using an exception for material from PET bottles, this must be documented by the plastic supplier.

Background to requirement

It is important to consider the potential exposure to unwanted chemicals from recycled plastics. Recycled plastic may contain residues of harmful additives from previous use. In mechanical recycling processes, many chemical substances remain in the material and can be transferred to the new products⁷. In chemical recycling processes such as pyrolysis and gasification, the plastic and most of its additives and possible contaminants are converted into basic chemicals. In other recycling processes, such as depolymerization, where the chemical structures are preserved, it cannot necessarily be ensured that no harmful additives and contaminants from the incoming plastic waste are included. It is possible to carry out a sample test for the most relevant substances over a certain interval, but as the recycled raw material can come from several sources and therefore can vary widely, it is not possible to carry out the testing necessary to identify all the potential "old additives".

Recycled fibres from PET bottles can also contain small amounts of unwanted substances such as antimony and heavy metals that originate from labels, glues, printing inks and waste from transporting and sorting the plastic. However, measurements have shown that the levels are well below the limits set for heavy metals in packaging materials in California's Toxics in Packaging Prevention Act of 2006⁸.

The test methods are as specified in Testing Methods Standard 100 by Oeko -Tex (2021).

08 Bio-based plastics: Raw materials to bio-based polymers

Raw materials used for the production of bio-based polymers must meet the requirements below.

⁷ Nordisk Ministerråd (2016). Få fordele ved kasserede tekstiler: LCA for forskellige behandlingsveje.

⁸ M. Whitt, Survey of heavy metal contamination in recycled polyethylene terephthalate used for food packaging, Journal of Plastic Film & Sheeting 2012.

Palm oil and soy

Palm oil, soybean oil and soy flour must not be used for bio-based polymer.

Sugar cane

The raw materials must meet either a) or b):

- a) Residual products* defined in accordance with (EU) Renewable Energy Directive 2018/2001. There must be traceability back to the production / process where the residual production occurred.
- b) Sugar cane must not be genetically modified**.

Sugar cane must be certified to Bonsucro standard, version 5.1 or later version or certified according to a standard that meets the requirements in Appendix 4.

The manufacturer of the bio-based polymer must have a chain of custody (CoC) certification according to the standard by which the raw material is certified. Traceability must at least be ensured by mass balance. Book and claim systems are not accepted.

The manufacturer of the bio-based polymer must document its purchase of certified raw materials for polymer production, for example in the form of specifications on an invoice or delivery note.

Other raw materials

The name (in Latin and a Nordic or English) and supplier of the raw materials used must be stated.

The raw materials must meet either c) or d):

- c) Be residual products* defined in accordance with (EU) Renewable Energy Directive 2018/2001. There must be traceability back to the production/process where the residual production occurred.
- d) Primary raw materials (e.g., corn), not genetically modified**. Geographical origin (country/state) must be stated.

** Residual products as defined by EU Directive 2018/2001/EC. Residues come from agriculture, aquaculture, fisheries, and forestry, or they can be processing residues. A processing residual product is a substance that is not one of the end products that the production process directly strives for. Residues must not be a direct target of the process and the process must not be changed to intentional production of the residual product. Examples of residual products are e.g., straw, husks, pods, the non-edible part of maize, manure, and bagasse. Examples of processing residues are e.g., raw glycerine or brown lye from paper production. Palm Fatty Acid Distillate (PFAD) from palm oil is not considered a residual/waste product and can therefore not be used.*

*** Genetically modified organisms are defined in EU directive 2001/18/EC.*

- Declaration by the manufacturer of the polymer, that palm oil (incl. PFAD (Palm Fatty Acid Distillate)) soybean oil and soy flour are not used as raw materials for the bio-based polymer.
- For residual products (sugar cane and other raw materials): Documentation from the polymer manufacturer which shows that the requirement's definition

of residual products is met, as well as traceability which shows where the residual product comes from.

- ☒ For sugar cane: Indicate which certification system sugar cane is certified for. A copy of a valid CoC certificate or a certificate number. Documentation such as an invoice or delivery note from the manufacturer of the bio-based polymer, showing the purchase of bio-based polymer from certified raw material in at least the same annual quantity as is used in the production of the bio-based polymer. Declaration stating that the sugar cane has not been genetically modified.
- ☒ For other raw materials: Name (in Latin and English) and geographical origin (country/state) of the raw materials used. Declaration by the manufacturer of the polymer stating that raw materials have not been genetically modified according to the definition in the requirement.

Background to requirement

In terms of resources and climate, it makes sense to use renewable raw materials rather than virgin fossils. However, it is important that the cultivation of bio-based raw materials is done in a sustainable way. Even renewable raw materials can be linked to environmental and social problems. The establishment of palm oil plantations is one of the main causes of rainforest deforestation, thus threatening the livelihoods of indigenous people, plants and animals. The rainforests are extremely important for biodiversity and are also important for regulating the climate. Soybeans are grown in areas that are often established at the expense of rainforests and forest savannas in South America. Soy production is one of the biggest threats to the rainforest on the American continent, especially in the southern Amazon⁹. Based on this, palm oil, soya oil and soya flour are prohibited as raw materials for bio-based polymers.

The most ideal is to use waste or residual products from, for example, agriculture, fishing, forestry or processing residual products defined according to (EU) Renewable Energy Directive 2018/2001.

By using waste or residual products as raw materials, you utilize parts that are not used as food products. PFAD (Palm Fatty Acid Distillate) from palm oil is not considered waste or residual product and must therefore not be used. PFAD occurs in the production of palm oil for the food industry, and it is rarely traceability in the processes where PFAD occurs.

There is a requirement for traceability, which shows where the residual product comes from. In EU-directive 2018/2001/EC, "the point of collection" is described as the point where waste or residual product occurs for the first time (e.g. for used cooking oil, the starting point will be the restaurants or production sites that produce the fried food). The traceability in this requirement must start at the point where waste or residual product first occurs.

Sugarcane is a relevant raw material for polymer production. As of today, sugar cane is not as strongly linked to problems with rainforest deforestation as mentioned above for palm and soya oil, but there can also be challenges linked to this production. As bio-based plastic is still relatively new and the number of

⁹ <http://www.worldwildlife.org/industries/soy>, (27.01.2016)

manufacturers relatively few, it is permitted sugarcane as a raw material, but there is a requirement that it be certified according to a sustainability standard that meets a number of requirements for, among other things, protection of biological diversity. Traceability at mass balance level is required for all certification systems. Book and claim system will not be approved. It is considered that the Bonsucro standard is the best tool on the market for sustainable sugarcane production today, and therefore this certification accepted.

For other raw materials, there is a requirement that the name of the raw material and the supplier must be stated. For primary raw materials, there is also a requirement that the origin of the raw material must be stated. Primary raw materials incl. sugar cane must not be genetically modified. Genetic modification is a highly debated topic, and several countries have banned the cultivation of GMOs. Topics discussed are food safety, land use, lack of knowledge about effects under local agricultural /forest conditions and risk of negative environmental and health impacts. Nordic Ecolabelling lays emphasis on the precautionary principle and takes based on regulations that have a comprehensive approach to GMOs. This means that sustainability, ethics and social benefit must be emphasized together with health and the environment. We are not principled against genetic engineering and GMOs per se but are concerned about the consequences when genetically modified plants, animals and microorganisms are spread in nature. Nordic Ecolabelling believes that GMOs should be assessed on a case-by-case basis. Research results have not clearly shown that today's GMO crops contributes to development towards a sustainable agriculture with less use of pesticides, and there is a lack of research on the long-term effects of genetically modified plants, both environmental and socio-economic consequences. There are possible adverse effects of GMOs along the entire value chain from research and development of the plants, via cultivation, to storage, use and waste management. In several of these phases, there is a lack of scientific studies, and there is a lack of comprehensive assessments.

O9 Additives in plastic and rubber

The requirement concerns additives added to the masterbatch or compound. The requirement applies to both recycled and virgin plastic. The requirement does not include the polymer production itself.

The requirement applies to all ingoing substances according to the definition in section 4.2.

The following substances must not be added to the masterbatch or compound for plastics and rubber:

- Carcinogenic, mutagenic and reproductively toxic substances (categories 1 and 2*)
- Substances on the REACH Candidate list of SVHC substances
<https://www.echa.europa.eu/candidate-list-table>

For the siloxanes D4, D5 and D6: D4 (CAS no. 556-67-2), D5 (CAS no. 541-02-6) or D6 (CAS no. 540-97-6) must only be included as residual substances from raw material production and is allowed for each in amounts up to 1000 ppm in the silicone raw material.

- PBT (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative) substances in accordance with REACH Annex XIII, including substances under investigation according to the ECHA PBT assessment list <https://echa.europa.eu/pbt/-/dislist/details/0b0236e1889ab857>
- Potential or identified endocrine disruptors, according to any of the following EU member state initiative "Endocrine Disruptor Lists":

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

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

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

N.B. A substance which is transferred to one of the corresponding sublists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sublist II which were evaluated under a regulation or directive which doesn't have provisions for identifying EDs (e.g. the cosmetic products regulation). For those substances, ED properties may still have been confirmed or suspected. Nordic Ecolabelling will evaluate the circumstances case-by-case, based on the background information indicated on sublist II.

- Phthalates
- Bisphenols
- Halogenated organic compounds in general (includes chlorinated polymers, PVC, chlorinated paraffins, fluorine compounds and flame retardants)
- Pigments and additives based on lead, tin, cadmium, chromium VI and mercury and their compounds
- Aziridine and polyaziridines
- Alkylphenols (AP) (e.g. butyl hydroxytoluene (BHT, CAS no. 128-37-0), butylated hydroxyanisole (BHA, CAS no. 25013-16-5), alkylphenol ethoxylates (APEO) and other alkylphenol derivatives (APD)
- For office supply in monomaterial: Carbon Black.

* Titanium dioxide (TiO₂) is excluded.

- Documentation from masterbatch and compound manufacturer/supplier according to Appendix 5.

Background to requirement

The requirement includes substances that are added to the polymer raw material in the masterbatch or compound. Substances originating from the polymer production itself are therefore not covered by this requirement.

The requirement applies to both virgin and recycled plastic.

Titanium dioxide (TiO₂) is exempt, see background for this under requirement O18.

For the background for banning the other substances see under O18 and O19.

O10 Rubber

Synthetic latex: The content of 1,3-butadiene in synthetic latex must be less than 1 mg/kg latex determined by test method EN 13130-4.

All types of rubber: The content of PAHs in the table below must comply with the stated requirement limits.

The impurities limit stated in definition of ingoing substances* does not apply to this requirement.

* See definition of impurities in section 4.2.

Table: Requirements for content of selected PAHs in the material

Substance name	CAS no.	Claim limit
Benzo [a] Pyrene	50-32-8	< 0.2 mg/kg
Benzo [e] pyrene	192-97-2	< 0,2 mg/kg
Benzo[a]Anthracene	56-55-3	< 0,2 mg/kg
Dibenzo[a,h]Anthracene	53-70-3	< 0,2 mg/kg
Benzo[b]Fluoranthene	205-99-2	< 0,2 mg/kg
Benzo[j]Fluoranthene	205-82-3	< 0,2 mg/kg
Benzo[k]Fluoranthene	207-08-9	< 0,2 mg/kg
Chrysen	218-01-9	< 0,2 mg/kg
Benzo[ghi]perylene	191-24-2	< 0,2 mg/kg
Indeno[1,2,3-cd]pyrene	193-39-5	< 0,2 mg/kg
Phenanthrene	85-01-8	Sum < 1 mg/kg
Pyrene	129-00-0	
Anthracene	120-12-7	
Fluoranthene	206-44-0	
Naphthalene	91-20-3	
Sum of all 15 PAHs in the table		< 1 mg/kg

Test method: Determination of polycyclic aromatic hydrocarbons (PAHs) by gas chromatography with mass selective detector (MSD).

Alternatively, a certificate for GS-mark Category 1 can be used.

- Test report showing that the requirement is met. The analysis laboratory must meet the requirements in Appendix 1. Alternatively, for PAHs, a GS-Mark certificate Category 1 according to AfPS GS 2019:01 PAK ¹⁰standard for rubber parts can be used.

Background to requirement

Vulcanizing agents are added to synthetic rubber, which are typically sulfur-containing substances or peroxides. Some rubber coverings are applied with a stabilizing polyester backing. Rubber can also be used as an adhesive, for example on tape.

¹⁰ https://www.baua.de/DE/Aufgaben/Geschaeftsfuehrung-von-Ausschuessen/AfPS/pdf/AfPS-GS-2019-01-PAK-EN.pdf?__blob=publicationFile&v=4

Several synthetic rubbers contain 1,3 butadiene, (CAS no. 106-99-0), which has the following classification: H340: May cause genetic defects and H350: May cause cancer. Butadiene functions as a monomer in the production of polymers such as synthetic rubber (latex) and elastomers such as styrene-butadiene rubber (SBR), polybutadiene rubber (PBR), polychloroprene (Neoprene) and nitrile rubber (NR) ¹¹. The requirement must ensure that efforts have been made to get the monomer content in the final product as low as possible.

For erasers, and pencils with erasers at the end, there is relevance in relation to the content of PAHs (polycyclic -aromatic- hydrocarbons), as both synthetic and natural rubber can contain PAHs.

Several PAHs are carcinogenic and genotoxic, and PAHs are considered the largest single group of carcinogenic chemical compounds. At the same time, PAHs can occur in the pigment Carbon Black and mineral oils.

There are more than 100 PAH compounds. Several PAHs are classified as carcinogenic with Carc. 1B. PAHs are found in plastic and rubber parts of a wide range of consumer products. They are present as impurities in some of the raw materials used to make such products, notably in softening oils and in carbon black. The substances are not deliberately added to the products in question, and they do not have any specific function as components of the plastic or rubber parts. Emollient oils are mineral oils that are produced from crude oil (PAHs that are still in the oil are called petrogenic). Carbon black is the product of complete combustion or thermal decomposition processes of heavy oils, such as coal (PAHs that are present are, however, mainly pyrogenic PAHs).

The requirement is at the same requirement level as the German GS label. This label is governed by the AfPS (Committee for Product Safety). The German authority published a new standard, which sets requirements for a PAH content in three different categories, where exposure and use differ. Category 1 is the sharpest and includes materials intended for use in toys or by children younger than 3 years, as well as materials in contact with the mouth or in prolonged contact with the skin. The requirement appears to be one of the strictest available and is already used by environmental certifications such as Der Blue Angel. The GS mark appears to be well known and is offered by many important accredited testing institutes such as Eurofins, TÜV and RISE/SP. To meet the requirement, the material must achieve the Category 1 level from GS marking according to the latest standard AfPS GS 2019:01 PAK.

4.6 Wood, bamboo, paper and cardboard

The following requirements include solid wood and bamboo, veneer and fiber raw materials for paper and cardboard, which are used in the product, if they comprise more than 10% by weight in the finished product.

O11 Wood species that may not be used

The requirement does not apply to paper labels that are pasted on the product.

¹¹ Dow <https://www.dow.com/hydrocarbons/c4/prod/buta.htm> besøgt 02.11.2018

Nordic Ecolabelling's list of tree species* consists of virgin tree species listed on:

- a) CITES (Annex I, II and III)
- b) IUCN's red list , categorized as CR, EN and VU
- c) Rainforest Foundation Norway's tree list
- d) Siberian larch (from forests outside the EU)

Eucalyptus and Acacia used for pulp and paper production are excluded from the list (note **).

Wood species listed on a) CITES (appendices I, II and III) **are not allowed** to be used.

Wood species listed in either b), c) or d) **can be used** if they meet all of the following requirements:

- The tree species does not originate from an area/region where it is IUCN red-listed, categorized as CR, EN or VU.
- The tree species does not originate from the Intact Forest Landscape (IFL), identified in 2000 <http://www.intactforests.org/world.map.html> .
- The wood species must originate from FSC or PEFC certified forest/plantation and must be covered by a valid FSC/PEFC traceability certificate (Chain of custody , CoC) documented/controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.
- Tree species grown in plantations must also originate from FSC- or PEFC-certified forests/plantations established before 1994.

** The list of restricted tree species can be found on the website:*

<http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements-2020/>

*** Regarding paper pulp, fiber raw material from eucalyptus/acacia must be at least 70% certified.*

Declaration from the manufacturer/supplier that wood species listed on a)-d) are not used in the product.

If species from lists b), c) or d) are used:

Valid FSC/PEFC Chain of Custody certificate from the applicant/ manufacturer/supplier which covers the specific wood species and which documents that the wood is controlled as FSC or PEFC 100% through the FSC transfer method or PEFC physical separation method.

The applicant/ manufacturer/supplier must document full traceability back to the certified forest unit and hereby document the following:

- The tree does not originate from an area/region where it is IUCN red-listed, categorized as CR, EN or VU.
- The tree species does not originate from the Intact Forest Landscape (IFL), defined in 2002 <http://www.intactforests.org/world.webmap.html>

- For plantations, the applicant/ manufacturer/supplier must document that the wood species does not originate from FSC- or PEFC-certified plantations established after 1994.

Background to requirement

The requirement only applies to virgin tree species and not tree species defined as recycled material according to ISO 14021.

The list of restricted tree species is based on the wood species that are relevant to the Nordic Ecolabel's criteria, i.e. tree species that have the potential to be included in Nordic Ecolabelled products. Listed tree species are indicated by the scientific name and the most common trade names. The scientific/trade name is not always sufficient, as there may be more scientific/trade names for the listed tree species than the list indicates.

Criteria for tree species included in the list are wood originating from:

- a) Tree species listed in CITES Appendices I, II and III.
- b) IUCN Red List, categorized as Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).
- c) Tree list Rainforest Foundation Norway¹² (Rainforest Foundation Norway)
- d) Siberian larch (originating in forests outside the EU)

CITES¹³ is an international convention for the control of trade (across borders) in wild animals and plants. CITES covers approximately 5,600 animal species and approximately 28,000 plant species, some of which are relevant species of wood (mainly tropical species). The tree species are, depending on how threatened they are, listed in Appendix I, II or III. The species listed in Appendix I are highly endangered and trade in these species is completely prohibited. For the remaining tree species, special permits are required for import and export (Annex II and III). CITES is regulated by EU legislation (Council Regulation (EC) No 338/97) and trees with valid CITES permits are considered legally harvested under the EUTR (EU Timber Regulation). The Swan's ban on the use of tree species listed in CITES (Appendix I, II or III) goes further than EU legislation. CITES regulates trade in endangered species, and there are also challenges with corruption in wildlife trade¹⁴. Nordic Ecolabelling therefore does not want to approve species in any of the appendices.

The IUCN Red Lists¹⁵ are the world's most comprehensive inventory of the global conservation status of the planet's biological species, including trees. Nordic Ecolabelling is aware that the IUCN's red list system only focuses on the species' extinction risk and is therefore not designed for an overall assessment of whether a tree species can be provided with a sustainable origin. However, the list is

¹² <https://www.regnskog.no/no/hva-du-kan-gjore/unnga-tropisk-tommer/tropiske-treslag> (visited January 2020)

¹³ <https://www.cites.org/> (visited January 2020)

¹⁴ Addressing corruption in CITES documentation processes Willow Outhwaite, Research and Analysis Senior Programme Officer, TRAFFIC, 2020: <https://www.traffic.org/site/assets/files/12675/topic-brief-addressing-corruption-in-cites-documentation-processes.pdf>

¹⁵ <http://www.iucnredlist.org/> (visited January 2020)

continuously updated and is thus an important tool for estimating the conservation status of a certain tree species on a global level. The Swan wants to ban tree species that are threatened with extinction (categories CR, EN and VU).

Regnskogfondet ¹⁶(Rainforest Foundation Norway) is a non-governmental organization in Norway that works to protect the world's remaining rainforests. Currently, the Rainforest Foundation does not see any credible certification systems operating in the tropics, and therefore recommends to stop buying tropical wood. The Rainforest Foundation has developed a list of tropical tree species based on tree species available on the Norwegian market. This list serves as a guide to comply with Norwegian guidelines for the non-use of tropical wood in public construction. We see this as a pragmatic method for handling tropical tree species in the Nordic market.

In addition, Siberian larch (originating from forests outside the EU) is on the tree list. Siberian larch is a sought-after tree species in the construction industry due to its high quality. The tree species is widespread in the northern boreal climate zone of Eurasia, and in particular the species *Larix sibirica* , *Larix gmelinii* , *Larix cajanderi* and *Larix sukaczewii* is widespread in the large areas of intact forest landscapes (IFL) in Russia. Siberian larch should be seen as an indicator of boreal IFL areas that are important to keep intact.

Exceptions to the tree list:

Nordic Ecolabelling is aware that tree species that come from b), c) or d) may originate from legal and sustainable forestry. Therefore, it is possible to use tree species listed under b), c) or d) if the applicant/manufacturer/supplier can demonstrate compliance with a number of strict certification and traceability requirements.

Many of the tree species on the list are found in countries that still have large areas of IFL. These are important to protect because of biodiversity and climate. Many of these countries also have a high risk of corruption and national legislation related to the environment, human rights and land ownership is weak and/or not controlled by the authorities. There are different opinions on whether certification is good enough to meet the challenges of forest management in countries with a high risk of corruption and illegal logging. For example, relevant challenges related to this have been published by Danwatch in a number of articles in 2018 ¹⁷, ¹⁸and by redd-monitor.org in 2019 ¹⁹. Greenpeace International has terminated its membership of FSC due to the fact that the certification body is no longer meeting its goals of protecting forests and human rights ²⁰.

¹⁶ <https://www.regnskog.no/no/hva-du-kan-gjore/unnga-tropisk-tommer/tropiske-treslag> (visited January 2020)

¹⁷ <https://danwatch.dk/undersogelse/dokumentfalsk-og-millionboeder-danske-byggemarkeder-saelger-trae-forbundet-til-ulovlig-hugst-i-amazonas/>

¹⁸ <https://danwatch.dk/undersogelse/baeredygtighedsmaerke-er-ingen-garanti-for-baeredygtigt-trae/>

¹⁹ <https://redd-monitor.org/2019/08/29/evicted-for-carbon-credits-new-oakland-institute-report-confirms-forced-evictions-for-green-resources-plantations-in-uganda/>

²⁰ <https://www.greenpeace.org/international/press-release/15589/greenpeace-international-to-not-renew-fsc-membership/>

Other environmental organizations such as WWF support certification as an important tool for sustainable forestry in these countries. Due to the uncertainty whether FSC and PEFC certification systems are good enough to protect important areas of biodiversity and ethical aspects such as human rights and land ownership in areas with a high risk of corruption, Nordic Ecolabelling has a precautionary approach and wants additional documentation on the tree species and its origin.

To document the full traceability of the tree species, the applicant/manufacturer/supplier must present a valid FSC/PEFC traceability certificate (Chain of Custody , CoC) covering the specific tree species and show that the tree is controlled as FSC or PEFC 100%, through the FSC transfer method or PEFC physical separation method . This means that the Swan does not accept FSC percentages or credit control systems and PEFC percentage systems. Full traceability of the tree species back to the forest/certified forest unit enables the applicant/ manufacturer/supplier to document that the tree species does not come from a region where it is IUCN Red Listed, categorized as CR, EN or VU. Full traceability also makes it possible to document that the tree species does not come from the Intact Forest Landscape (IFL), defined by Intactforest.org in 2002²¹ Intactforest has been monitoring IFL areas since 2000 and has developed an online mapping tool. Which shows the extent of IFL back to 2000. The monitoring results show that the world's IFL is deteriorating at an alarming rate, which is why Nordic Ecolabelling refers to 2000.

Plantation: Nordic Ecolabelling believes that responsibly managed forest plantations can play a role in conserving natural IFL by reducing the pressure to harvest the world's remaining natural forests. To ensure that the plantation has not replaced native ecosystems (forest/grasslands) in the last 25 years, tree species must come from FSC or PEFC certified plantations established before 1994. 1994 is in line with the FSC International Forestry Standard (version 5.2), while PEFC is working on 2010.

For fiber raw materials to paper and carton:

Eucalyptus and acacia, there is used to manufacture of paper pulp and paper, is exempt from the list as these species are grown in plantations to the specific use in paper pulp - and the paper industry. However, fiber raw material from acacia/eucalyptus must be at least 70% FSC/PEFC certified. The remaining proportion of the fiber raw material must be covered by the FSC/PEFC control schemes. The applicant/ manufacturer must annually report paper pulp (name of pulp pulp) used in the production of eco-labelled products. This ensures that the eucalyptus/ acasia pulps contain at least 70% certified raw materials.

The list of restricted tree species is located on <http://www.nordic-ecolabel.org/certification/paper-pulp-printing/pulp--paper-producers/forestry-requirements-2020/> .

O12 Traceability and certification

The requirement does not apply to paper labels that are pasted on the product.

²¹ <http://www.intactforests.org/world.webmap.html>, visited January 2020

Species name

The applicant/ manufacturer/supplier must state the name (species name) of the wood/bamboo used.

Chain of Custody certification

Applicant/manufacturer of the toy or applicant's/ manufacturer's supplier of wood/bamboo must have Chain of Custody certification under the FSC/PEFC schemes.

Applicant/ manufacturer who only uses recycled material (which is not FSC/PEFC certified) is exempt from the requirement for Chain of Custody certification.*

Certified wood/bamboo/fibre raw materials

At least 70 wt% of the wood/bamboo used in the Nordic Swan Ecolabelled toy product must origin from forest managed according to sustainable forestry management principles that meet the requirements set out by FSC or PEFC chain of custody schemes or origin from recycled material* (which is not FSC/PEFC certified).

The remaining percentage must be covered by the FSC/PEFC compliance schemes (FSC Controlled Wood/PEFC Controlled Sources) or be recycled material* (which is not FSC/PEFC certified).

If the manufacturer of the ecolabelled product is chain of custody certified the following applies:

The manufacturer must provide evidence with a balance sheet from the company's accounting system correctly showing account for and allocated inputs and outputs of certified wood/bamboo raw material and of any material from controlled sources (FSC controlled wood/PEFC controlled sources) or be recycled material* (which is not FSC/PEFC certified), to their manufacturing facility and resulting ecolabelled product.

If the supplier is chain of custody certified the following applies:

The manufacturer of the ecolabelled product must submit documentation on the purchase of wood/bamboo/fibre raw material from the CoC-certified subcontractor which shows that the certification requirement of at least 70% certified is fulfilled and that the remaining share is covered by the control schemes (FSC controlled wood/PEFC controlled sources) or be recycled material* (which is not FSC/PEFC certified). This must be specified on the invoice/delivery note with certification claim. The manufacturer of the ecolabelled product must ensure that the wood/bamboo/fibre raw material specified on the invoice is used in the production of the Nordic Swan Ecolabelled product.

** Recycled material: See definition in section 4.2.*

Please note that recycled material must meet requirement O13.

☒ Name (species name) of the wood/bamboo used the Nordic Swan Ecolabelled toy.

- The applicant/manufacturer of the Nordic Swan Ecolabelled product or supplier must provide valid FSC/PEFC CoC certification/ link to the certification holder's valid certification information in FSC/PEFC databases that includes all wood/bamboo/fibre raw materials used in the Nordic Swan Ecolabelled product.

If the manufacturer of the Nordic Swan Ecolabelled product is chain of custody certified:

- The manufacturer of the Nordic Swan Ecolabelled product shall provide audited accounting documents that demonstrate that at least 70% of the materials allocated to the Nordic Swan Ecolabelled product or production line originate from forests or areas managed according to sustainable forestry management principles that meet the requirements set out by FSC or PEFC chain of custody scheme. If the product or production line includes uncertified virgin material, proof shall be provided that the content of uncertified virgin material does not exceed 30% and is covered by a verification system that ensures that it is legally sourced and meets any other requirement set out by FSC or PEFC with respect to uncertified material.

If the subcontractor is chain of custody certified:

- Documentation from the manufacturer of the Nordic Swan Ecolabelled product on the purchase of wood raw material from the CoC-certified subcontractor which shows that the certification requirement of at least 70% certified is fulfilled and that the remaining share is covered by the control schemes (FSC controlled wood / PEFC controlled sources). This must be specified on the invoice/delivery note with certification claim. The manufacturer of the Nordic Swan Ecolabelled product must declare that the wood/bamboo/fibre raw material that fulfils the requirement is used in the Nordic Swan Ecolabelled product.

For recycled material (not certified by FSC or PEFC):

- Supplier of wood/bamboo raw materials must declare:
- That wood/bamboo/fibre raw materials is recycled according to the definition in the requirement.
 - From where the recycled material is purchased (e.g. from a recycling station).
 - If possible, state what the recycled material has previously been used for and where it has been used.
 - The manufacturer of the Nordic Swan Ecolabelled product must declare:
 - That the recycled material is used in the Nordic Ecolabelled product.

Background to requirement

Name of the wood raw material. Nordic Ecolabelling sets requirements to gain information about which tree species are used in Nordic Ecolabelled products. The requirement makes it possible to control the Chain of Custody certificates in the supply chain (check whether the stated tree species is covered by the Chain of Custody certificate) as well as provide information for future forest requirements. If recycled material is used in the Nordic Ecolabelled product, and particularly in the form of recirculated fibre, it is not always

possible to specify the name (species name) of all wood raw materials used. In this case, the requirement for documentation of recycled material is to be met.

FSC, PEFC and EUTR. Forest Stewardship Council (FSC) and Programme for the endorsement of Forest Certification schemes (PEFC) cover together 98% of the world total certified sustainable managed forest area²², and are predominant in the global market for certified sustainable wood. Both schemes cover Forest Management certification of forests and subsequent Chain of Custody (CoC) certification, which documents the traceability of timber and timber products from certified forests. Both systems are considered common among forest owners, forest industries, manufacturers and distributors of wood products, and public authorities as reliable systems for sustainable forestry.

FSC updated traceability standard from 2015²³ and PEFCs traceability standard from 2013²⁴ fully meets the requirements of EU Timber Regulation (995/2010/EC)²⁵ prohibiting the marketing and sale of illegal timber in the EU. This applies to imported wood, as well as wood harvested in the EU. Nordic Ecolabelling recognizes both the FSC and PEFC as schemes that provide sufficient guarantees for legal and sustainable forestry.

Traceability Certification. Nordic Ecolabelling requires that the applicant/manufacturer is Chain of Custody certified by the FSC/PEFCs schemes. The requirement for Chain of Custody certification contributes to traceability in the supply chain within the FSC and PEFCs guidance and control systems for traceability. The company's Chain of Custody certification proves how certified wood is kept separate from not certified wood in the production, administration and warehousing and is checked annually by independent certification bodies. There exist different types of Chain of Custody certifications, which varies according to the minimum content of certified wood and the way this is calculated. Both schemes allows, within specified circumstances and rules, to mix wood from certified forests with recycled material or legal wood from non-certified forests. Therefore, it is not certain that a specific batch of FSC or PEFC certified wood necessarily come from certified forest. In all cases, the remaining share of the wood shall comply with a number of minimum requirements to ensure that it can be considered as "legal timber". Both the FSC and PEFC schemes allow several methods to verify the traceability: Physical separation method, percentage based method and volume credit method. Nordic Ecolabelling accepts all FSC and PEFCs methods to verify traceability and the share of certified and controlled wood/sources. The applicant/manufacturer must submit a valid FSC/ PEFC Chain of Custody certificate, covering all wood raw material used in the Nordic Ecolabelled product, as documentation.

Nordic Ecolabelling equates recycled material with virgin wood material from sustainable forestry. Recycled materials not covered by an FSC/PEFCs Chain of Custody certification can also be used in Nordic Ecolabelled products. Suppliers of recycled material are exempted from the requirement regarding FSC/PEFCs

²² UN: Forest Products – Annual market review 2011-2012, ch. 10

²³ <https://ic.fsc.org/en/our-impact/timber-legality/ensuring-compliance>, visited 2015-12-21

²⁴ <http://www.pefc.org/certification-services/eu-timber-regulation>, visited 2015-12-21

²⁵ http://ec.europa.eu/environment/forests/timber_regulation.htm

Chain of Custody certification. In case of recycled material evidence shall be covered by EN 643 delivery notes.

Certified wood raw materials. Applicants must document that at least 70% of all wood raw material (virgin/recycled material) used in the Nordic Ecolabelled product/production line comes from forestry certified under the FSC or PEFC schemes or is recycled material. The remaining proportion of wood must meet the requirements of FSC controlled wood or PEFC controlled sources or be recycled. The requirement limit, a minimum of 70% of all wood raw material (virgin or recycled), correspond to the FSC and PEFCs requirement limits for use of the respective labels on products, such as "FSC Mix" and "PEFC certified". FSC and PEFC has together five recognized official existing labels. Further information about the use of labels can be found on FSC²⁶ and PEFCs²⁷ websites. The requirement can make it easier for manufacturers of Nordic Ecolabelled products to document the requirement, as they can demand labelled FSC/PEFC products. Recycled material is explicitly highlighted in the requirement as both FSC and PEFCs schemes include certified recycled materials.

Nordic Ecolabelling equates as previously mentioned recycled material with virgin wood material from sustainable forestry. Recycled materials not covered by FSC/PEFC's Chain of Custody certification, can also be used in the Nordic Ecolabelled products. The share (% units) of recycled material must meet the requirement regarding the share of wood raw material certified as FSC or PEFC sustainable forestry.

It is specified that the manufacturer must provide evidence with a balance sheet from the company's accounting system showing correctly account for and allocated inputs and outputs of certified wood raw material, of recycled material and of any material from "controlled" sources, to their manufacturing facility and resulting Nordic Ecolabelled products. This ensures that the FSC/PEFC credits on a production levels is accounted/recorded to the Nordic Ecolabelled production, and not to other FSC/PEFC labelled products. I.e. the amount of certified wood raw material that is "sold" into the Nordic Ecolabelled product/production line subsequently is removed from the manufacturer's accounting system, ensuring that the certified wood material is not sold twice. This will also stimulate increased demand for certified products.

The applicant/manufacture must demonstrate that the quantity of certified wood raw material or recycled material is met. The certification % shall be documented through the applicant's/manufactures accounting system and invoice or delivery note (paper or via e-invoicing), which also indicates the companies certification codes from which the wood raw material is purchased from. It must be clear which parts of the packing slip or invoice delivery that is certified (e.g. claim/material category must appear, such as FSC MIX and FSC 100% associated with the product concerned on the invoice or delivery note).

Certification and accreditation. The certification (control and approvement of requirements in the standard, chain of custody and eventual use of label) must be conducted by an independent, competent and accredited third party and follow the relevant international guidelines for the certification: "ISO/IEC 17065:2012

²⁶ <http://welcome.fsc.org/understanding-the-fsc-labels.27.htm>

²⁷ <http://www.pefc.co.uk/chain-of-custody-logo-use/pefc-label>

Conformity assessment – Requirements for bodies certifying products, processes and services" or equivalent and accredited by an accreditation body operating in accordance with "ISO 17011:2004 Conformity assessment – General requirements for accreditation bodies accrediting conformity assessment bodies" or equivalent.

The accreditation (i.e. verification and approval of the certification firm is working properly) must be undertaken by a national or international body, systems and procedures are consistent with ISO 17011:2004 Conformity assessment – General requirements for accreditation bodies accrediting conformity assessment bodies or equivalent.

O13 Chemicals in recycled/recycled parts

Reused/recycled elements in wood or bamboo must be untreated.

State the previous area of use for the reused/recycled element. Wood from industrial construction must not be used.

- Declaration of what the recycled element in wood/bamboo has previously been used for, plus a declaration that it is untreated. Nordic Ecolabelling may require further information if there is any doubt about compliance with the requirement.

Background to requirement

The requirement has been set in order to maintain a certain amount of control over the type of recycled material used and better control in the drive to ensure that any materials used are free from undesirable substances. Setting a requirement that the wood must be untreated limits the scope to use such wood, but since it is difficult to know what kinds of chemicals have been used, Nordic Ecolabelling wishes to be restrictive. The requirement covers both surface treatment and impregnation with wood preservative.

4.7 Metal

The metal requirements apply to metal in the product, including casings and containers.

O14 Product parts in metal

Metal must not be used in holsters, casings, dispensers, reels or application parts for the Nordic Ecolabelled product.

Exception for springs, ink cartridges and tips for writing instruments, the tear-off part of a tape dispenser and small metal parts which make up less than 5% by weight of the product.

- Declaration from the applicant. Appendix 2 can be used.

Background to requirement

RPS is found for a high ratio of renewable raw materials and raw materials with a long supply horizon without this giving any deterioration in the product in relation to the function required. Metal generally has a shorter supply horizon than plastic and renew-able raw materials.

This means that replacing metal with either fossil or renewable plastic gives an environmental gain in relation to the resources consumed if the replacement does not result in considerably diminished quality and a shorter product lifetime. It is assessed that this is possible for the holsters, casings, dispensers, reels or application components for the Nordic Swan Ecolabelled product. For springs in ballpoint pens, ink cartridges and related tips and the tear-off section of a tape dispenser, however, it is assessed that there is a need to use metal to achieve the required function and quality.

O15 Heavy metals

Metal parts must not contain chromium VI, nickel, mercury, lead, arsenic or cadmium*.

Surface treatment with chrome, nickel, lead, cadmium, tin or zinc must not occur.

There is an exception from the requirement for metal parts without skin contact and which weigh less than 5 g, as well as an exception for the tip of ballpoint pens.

By "tip" is meant only the metal part which holds the ball in the pen.

** The requirement does not apply to residuals from raw materials production or processing. Residuals are considered to be residuals, pollutants and contaminants derived from raw materials production/processing included in metals in concentrations of < 100 ppm. Substances that are deliberately added to a raw material or included for a purpose are not considered to be impurities, irrespective of the concentration.*

- Declaration from the metal supplier/manufacturer for metal parts covered by the requirement that the requirement is fulfilled. Appendix 6 can be used.

Background to requirement

For background see under requirement O19.

4.8 Chemical product

The requirements include the chemical product that is included in the Nordic Swan ecolabelled product. The chemical product can be e.g., ink, paint, graphite, colored pencils, crayons, chalk, varnish, foils for surface treatment, glue and other adhesives.

Several of the requirements are set for ingoing substances in the chemical product. See definition of ingoing substance and impurities in table in section 4.2.

O16 Overview of chemicals

The type of chemical product must be stated (e.g. ink).

For each chemical product, a complete formulation with all raw materials must be provided. For each raw material, the formulation must contain information on:

- Trade name
- Chemical name

- CAS No. and/or EC No.
- Amount (% by weight)
- Function

For each raw material, a safety data sheet must be sent in English or Scandinavian in accordance with Annex II of REACH 1907/2006.

- For each chemical product a list of the ingoing raw materials with information, as described in the requirement.
- Safety data sheet in English (or Scandinavian) for each chemical raw in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC).

Background to requirement

In order to get an overview of which chemical raw materials are included in the chemical product, a complete formulation of the chemical product and information and safety data sheets for all ingoing chemical raw materials must be submitted.

O17 Classification of the chemical product

The chemical product must not be classified according to the hazard classes described in the table below.

Table: Classification of the chemical product

CLP regulation 1272/2008:		
Hazard class	Hazard class and category	Hazard code
Hazardous to aquatic environment	Aquatic Acute 1	H400
	Aquatic Chronic 1	H410
	Aquatic Chronic 2	H411
	Aquatic Chronic 3	H412
	Aquatic Chronic 4	H413
Dangerous for the ozone layer	Ozone	H420
Carcinogenicity *	Carc. 1A or 1B	H350
	Carc. 2	H351
Germ cell mutagenicity *	Muta. 1A or 1B	H340
	Muta. 2	H341
Reproductive toxicity*	Repr. 1A or 1B	H360
	Repr. 2	H361
	Lact	H362
Acute toxicity	Acute Tox. 1 or 2	H300
	Acute Tox. 1 or 2	H310
	Acute Tox. 1 or 2	H330
	Acute Tox. 3	H301
	Acute Tox. 3	H311
	Acute Tox. 3	H331
	Acute Tox. 4	H302
	Acute Tox. 4	H312
Acute Tox. 4	H332	

Specific target organ toxicity with single or repeated exposure	STOT SEE 1 STOT SEE 2 STOT RE 1 STOT RE 2	H370 H371 H372 H373
Corrosive / irritating to the skin	Skin Corr. 1A, 1B or 1C Skin Irritation. 2	H314 H315
Aspiration hazard	Asp. Tox. 1	H304
Respiratory or skin sensitisation	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317
Serious eye damage / eye irritation	Eye Dam. 1 Skin Irritation. 2	H318 H319

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

Please note that the manufacturer/supplier of the chemical product is responsible for the classification.

- Safety data sheet in English (or Scandinavian) for the chemical product in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC).
- State the classification of the chemical product. Appendix 8 can be used.

Background to requirement

Nordic Ecolabelling sets requirements for environmental and health classification of products to ensure that products that are toxic or harmful to the environment and/or health cannot be Nordic Swan ecolabelled. The requirement has been changed in relation to generation 4 of the criteria in order to be in line with Nordic Ecolabelling's other criteria for chemically technical products.

O18 Classification of ingoing substances

Ingoing substances (see definition in section 4.2) in the chemical product must not be classified according to the hazard classes described in the table below. For classification of preservatives, see requirement O22.

For products marketed to children as well as office/hobby paints and crayons, there are additional requirements, cf. table below.

Note that for residual monomers in polymers there is also an additional classification requirement in O21.

Exceptions:

- Exempted from this requirement are substances classified H302, H312 and/or H332 up to a total amount of 1000 ppm (0.1000% by weight) in the chemical product.
- Exempted from this requirement is up to 1.0% methanol in polyvinyl alcohol, with a maximum level of 0.12% methanol from polyvinyl alcohol in the chemical product.
- Exception for up to 1% anhydrous ammonia CAS no.: 7664-14-7 in the raw material.
- Exempted from this requirement is up to 10 ppm formaldehyde in hobby paint with gloss. The exception only covers formaldehyde in the binder

(polymer) and use of this exception requires that it be documented with tests that the formaldehyde level is max. 10 ppm in the finished hobby paint measured with the VdL-RL03 - method, cf. VdL Guideline 03 or another equivalent method.

- Exempted from this requirement is titanium dioxide (TiO₂). However, the exception does not apply to the following products for children: chalk, crayons and hobby paints, if the TiO₂ raw material contains ultrafine particles, see under O19.

Table: Classification of ingoing substances

CLP regulation 1272/2008:		
Hazard class	Hazard class and category	Hazard code
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity*	Repr. 1A or 1B Repr. 2 Lact	H360 H361 H362
Endocrine disruption for human health**	ED HH 1 ED HH 2	EUH380 EUH381
Endocrine disruption for the environment**	ED ENV 1 ED ENV 2	EUH430 EUH431
Persistent, Bioaccumulative and Toxic properties**	PBT	EUH440
Very Persistent, Very Bioaccumulative properties**	vPvB	EUH441
Persistent, Mobile, and Toxic properties	PMT	EUH450
Very Persistent, Very Mobile properties	vPvM	EUH451
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310 H330 H301 H311 H331
Specific target organ toxicity with single or repeated exposure	STOT SEE 1 STOT SEE 2 STOT RE 1 STOT RE 2	H370 H371 H372 H373
Aspiration hazard	Asp. Tox. 1	H304
The prohibitions below only include products for children as well as office/hobby paints and crayons		
Sensitizing by inhalation or skin contact	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317
Acute toxicity	Acute Tox 4 Acute Tox 4 Acute Tox 4	H302 H312 H332

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

* Complexing agents of the type MGDA and GLDA may contain NTA impurities in the raw material in concentrations of less than 0.2% if the concentration of NTA in the chemical product is below 0.1%.

*** See also requirement O19, for additional requirements for potential or identified endocrine disrupting substances, PBT/ vPvB substances and endocrine disrupting substances.*

- Safety data sheet in English (or Scandinavian) for each raw material in line with prevailing European legislation (Annex II to REACH Regulation, 1907/2006/EC).
- Completed and signed declaration from all the raw material manufacturer/supplier (Appendix 7).
- Completed and signed declaration from the manufacturer of the chemical product (Appendix 8).

Background to requirement

Nordic Ecolabelling sets requirements for environmental and health classification of ingoing substances to ensure that products that are toxic or harmful to the environment and/or health cannot be Nordic Swan ecolabelled. The requirement has been changed in relation to generation 4 of the criteria in order to be in line with Nordic Ecolabelling's other criteria for chemically technical products.

Titandioxid (TiO₂)

On 18. February 2020, the decision taken by the European Commission to classify TiO₂ as a suspected carcinogen (category 2) by inhalation according to the CLP regulation was published. The classification has been met with criticism because the risk that gives rise to the hazard property according to CLP concerns inhalation and powder form and not the chemical substance itself. This classification has been annulled by the European Court of Justice in November 2022, the annulment was appealed, and the case is still pending. The classification continues to apply until the appeal is settled. According to SCCS/1661/23, genotoxicity from titanium dioxide cannot be ruled out in oral products and products that can be inhaled, and no safe limit for TiO₂ can be established in those products.

The classification of titanium dioxide as carcinogenic by inhalation is only applicable to mixtures in the form of powder containing at least 1% titanium dioxide particles, which are in the form of or incorporated in particles with an aerodynamic diameter of $\leq 10 \mu\text{m}$. This means that if TiO₂ - or TiO₂ mixtures do not exist in this specific form, the classification does not apply.

Liquid and certain solid mixtures are not classified, which is why Nordic Ecolabelling has made an exception for the use of titanium dioxide in wet and solid/solid products. However, the exception does not apply to chalk, crayons and hobby paint for children, see under O19.

O19 Prohibited substances

The following ingoing substances (see definition in section 4.2) must not be included in the chemical product:

- Alkylphenols (AP) (e.g. butyl hydroxytoluene (BHT, CAS no. 128-37-0), butylated hydroxyanisole (BHA, CAS no. 25013-16-5), alkylphenol ethoxylates (APEO) and other alkylphenol derivatives (APD)
- Benzalkonium chloride, CAS no. 8001-54-5
- Bisphenols and bisphenol derivatives belonging to the group of 34 substances that have been identified by ECHA for further EU regulatory risk management that are known or potential endocrine disruptors for the environment or for human health, or that can be identified as toxic for reproduction²⁸
- Boric acid, borates and perborates.
- DADMAC (dialkyldimethylammonium chloride), CAS No. 68424-95-3
- DTPA (diethylenetriamine pentaacetate), CAS no. 67-43-6 and its salts
- EDTA (ethylenediaminetetraacetic acid), CAS no. 60-00-4, and its salts
- Colours:
 - Azo dyes which can split off carcinogenic aromatic amines (see Appendix 3)
 - Carbon Black
 - Bioaccumulative (BCF > 500 (OECD 305 AE) or Log Kow > 4.0 (OECD method 107, 117 or 123).
 - For chalk, crayons and hobby paints for children: Titanium dioxide (TiO₂), which contains ultrafine particles (< 0.1 µm).
If TiO₂ is used in the above products, a test report must be submitted, which shows that the TiO₂ raw material does not contain ultrafine particles (< 0.1 µm).
- Phthalates
- Halogenated and/or aromatic solvents
Solvents are defined as in Commission Directive 1999/13/EC: organic substances with a vapor pressure of at least 0.01 kPa at 20 °C.
- Quaternary ammonium compounds which are not aerobically or anaerobically biodegradable
- Microplastics
Microplastics are synthetic polymer microparticles as defined in REACH Regulation ((EC) No 1907/2006), Annex XVII, Entry no. 78:
Synthetic polymers that are solid and which fulfil both of the following conditions:

²⁸ EC/List No. 201-245-8 (BPA), 201-025-1 (BPB), 401-720-1 (4,4'-Isobutylethylidenediphenol), 216-036-7 (BPAF) and its 8 salts (278-305-5; 425-060-9; 443-330-4; 468-740-0; 469-080-6; 479-100-5; 943-265-6; 947-368-7), 201-250-5 (BPS), 201-240-0 (BPC), 204-279-1 (TBMD), 201-618-5 (6,6'-di-tert-butyl-4,4'-butylidenedi-m-cresol), 242-895-2, 248-607-1, 405-520-5 (D8), 217-121-1 (DAB), 227-033-5 (TMBPA), 210-658-2 (BPF), 411-570-9, 277-962-5 (contains BPS, 500-086-4 (contains BPA), 500-263-6 (contains BPA), 500-607-5 (contains BPA), 701-362-9, 904-653-0 (contains BPA), 908-912-9 (contains BPF), 926-571-4 (contains BPA), 931-252-8 (contains BPA), 941-992-3 (contains BPS), 943-503-9 (contains BPA).

(a) are contained in particles and constitute at least 1 % by weight of those particles; or build a continuous surface coating on particles;

(b) at least 1 % by weight of the particles referred to in point (a) fulfil either of the following conditions:

i. all dimensions of the particles are equal to or less than 5 mm;

ii. the length of the particles is equal to or less than 15 mm and their length to diameter ratio is greater than 3.

The following polymers are excluded from this designation:

(a) polymers that are the result of a polymerisation process that has taken place in nature, independently of the process through which they have been extracted, which are not chemically modified substances;

(b) polymers that are degradable as proved in accordance with Appendix 15 [to REACH, Regulation (EC) No 1907/2006].

(c) polymers that have a solubility greater than 2 g/L as proved in accordance with Appendix 16 [to REACH, Regulation (EC) No 1907/2006].

(d) polymers that do not contain carbon atoms in their chemical structure.

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

- Nanomaterial/particles*
- Exemptions from the requirement are:
- **Pigments**. This exemption does not apply to pigments added for other purposes than imparting colour.
- Synthetic amorphous silica (SAS). This exemption applies to non-modified synthetic amorphous silica.

** Nanomaterials/-particles are defined according to the EU Commission Recommendation on the Definition of Nanomaterial (2022/C 229/01):*

'Nanomaterial' means a natural, incidental or manufactured material consisting of solid particles that are present, either on their own or as identifiable constituent particles in aggregates or agglomerates, and where 50 % or more of these particles in the number-based size distribution fulfil at least one of the following conditions:

(a) one or more external dimensions of the particle are in the size range 1 nm to 100 nm;

(b) the particle has an elongated shape, such as a rod, fibre or tube, where two external dimensions are smaller than 1 nm and the other dimension is larger than 100 nm;

(c) the particle has a plate-like shape, where one external dimension is smaller than 1 nm and the other dimensions are larger than 100 nm.

- Nitroalkanes: nitromethane (CAS no. 75-52-5), 1-nitropropane (CAS no. 108-03-2) and nitroethane (CAS no. 79-24-3).
- NTA (nitrilotriacetic acid), CAS no. 139-13-9 and its salts.

Exception: Complexing agents of the type MGDA and GLDA may contain NTA impurities in the raw material in concentrations below 0.2% if the concentration of NTA in the chemical product is below 0.1%.

- Organic chlorine compounds, hypochlorite and hypochlorous acid

Exception: Preservatives may contain organic chlorine compounds.

- PFAS (per- and polyfluoroalkyl substances).
- Perfume

Exception: In finger paints for children, the bitter substance naringin (CAS 10236-47-2) and denatonium benzoate (CAS 3734-33-6) are allowed.

- Potential or identified endocrine disruptors, according to any of the following EU member state initiative "Endocrine Disruptor Lists":
 - <https://edlists.org/the-ed-lists/list-i-substances-identified-as-endocrine-disruptors-by-the-eu>
 - <https://edlists.org/the-ed-lists/list-ii-substances-under-eu-investigation-endocrine-disruption>
 - <https://edlists.org/the-ed-lists/list-iii-substances-identified-as-endocrine-disruptors-by-participating-national-authorities>

N.B. A substance which is transferred to one of the corresponding sublists called "Substances no longer on list", and no longer appears on any of List I-III, is no longer excluded. The exception is those substances on sublist II which were evaluated under a regulation or directive which doesn't have provisions for identifying EDs (e.g. the cosmetic products regulation). For those substances, ED properties may still have been confirmed or suspected. Nordic Ecolabelling will evaluate the circumstances case-by-case, based on the background information indicated on sublist II.

- Siloxanes D4, D5, D6 and HMDS
- Substances on the REACH Candidate list of SVHC substances <https://www.echa.europa.eu/candidate-list-table>
- PBT (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative) substances in accordance with REACH Annex XIII, including substances under investigation according to the ECHA PBT assessment list <https://echa.europa.eu/pbt/-/dislist/details/0b0236e1889ab857>
- Silver, colloidal silver and nanosilver
- Triclosan
- The heavy metals Cd, Pb, Cr VI, Hg and As.

Completed and signed declaration from all the raw material manufacturer/supplier (Appendix 7).

- Completed and signed declaration from the manufacturer of the chemical product (Appendix 8).
- If TiO₂ is included in chalk, crayons and hobby paints for children: Test report showing that the TiO₂ raw material does not contain ultrafine particles (< 0.1 μm).

Background to requirement

Alkylphenols (AP), alkylphenol ethoxylates (APEO) and other alkylphenol derivatives (APD)

Alkylphenols is a group of mainly non-ionic surfactants that are produced in large volumes and their use leads to widespread release to the aquatic environment. APEOs are highly toxic to aquatic organisms and degrade to more environmentally persistent compounds (APDs). Ethoxylated nonylphenol and several other alkylphenols are included in the Candidate List due to endocrine disrupting properties. Other alkylphenols are polyalkylated phenols such as butylated hydroxytoluene (BHT) and butylated hydroxyanisole (BHA) which have antioxidant properties. of the perfume mixture which can affect the stability of the entire product.

Benzalkoniumchlorid

Benzalkonium chlorides (BACs) is part of a group of chemicals with wide applications due to their antimicrobial properties against bacteria, fungi and viruses. There is a risk that frequent and widespread use of BACs in commercial products can generative selective environments for microbes and contribute to resistance to antibiotics. Furthermore, there is a risk to consumer exposure due to their toxicity and allergenic properties.

Bisphenols

Several bisphenols with the general bisphenol structure and bisphenol derivatives which have constituents with structural properties common to bisphenols are now prohibited. Based on the potential for widespread use and available information on potential endocrine disruptors, reproductive toxicity and PBT/vPvB properties, 34²⁹ substances were identified in need for further regulatory risk management in EU³⁰.

Boric acid, borates and perborates

Perborates are sometimes used as bleaching agents. Several perborates are classified as toxic to reproduction.

²⁹ Assessment of regulatory needs: Bisphenols. ECHA – 16 December 2021: Section 2.1: Bisphenols for which further EU RRM is proposed – restriction <https://echa.europa.eu/documents/10162/c2a8b29d-0e2d-7df8-dac1-2433e2477b02>

³⁰ Annex XV restriction report <https://echa.europa.eu/documents/10162/450ca46b-493f-fd0c-afec-c3aea39de487>

DADMAC (dialkyldimethylammonium chloride)

DADMAC (dialkyldimethylammonium chloride) is a group of cationic surfactants with very high ecotoxicity, slow aerobic biodegradability and no anaerobic biodegradability (there is little information on this), which is why DADMAC is not desirable.

EDTA and DTPA

EDTA (ethylenediaminetetraacetic acid and its salts) is not easily degradable and the EU's risk assessment shows that under the conditions in municipal waterworks, EDTA either does not break down at all or only to a small extent.³¹ Today, there are more environmentally friendly alternatives that are degradable and can replace EDTA. An example is MGDA (methylglycinediacetic acid). EDTA is used as a complexing agent in many chemical-technical products. DTPA has similar properties to EDTA.

Colours

Azo dyes that can split off carcinogenic aromatic amines (see Appendix 3).

Carbon Black: It has no harmonized classification, but many self-classify with Carc. 2.

Bioaccumulable colors are undesirable, as these can be taken up in both the food chain and in humans, without know consequences.

Titanium dioxide (TiO₂): Regarding TiO₂ generally see under O18. Chalk, colored chalk and hobby paint for children must not contain TiO₂ raw material which contains ultrafine particles (< 0.1 µm). The background for this is the EU commission's SCEEER assessment in 2023 of the safety of using TiO₂ in toys³², which could not rule out a risk when using TiO₂ if the particles are ultrafine, i.e. below 0.1 µm. If the particles are over 0.1 µm, TiO₂ is permitted in chalk, crayons and hobby paints for children.

Phthalates

Several phthalates have been identified as endocrine disruptors, and some of them are classified as reproductive toxicants. For these reasons, several phthalates are included in the candidate list. Due to their dangerous properties, phthalates pose a threat to the environment and human health, and this group of substances is banned.

Halogenated and/or aromatic solvents

Halogenated solvents are harmful to health, often not easily biodegradable and can have negative effects on the earth's ozone layer. Some halogenated solvents are suspected of causing cancer.

³¹ European Union (2004). Risk Assessment Tetrasodium Ethylenediaminetetraacetate , Final Report. <https://echa.europa.eu/documents/10162/415c121b-12cd-40a2-bd56-812c57c303ce> (retrieved 11.09.2020).

³²Opinion on safety of titanium dioxide in toys, Sheer, 9 June 2023 ([scheer_o_040.pdf \(europa.eu\)](#)).

Quaternary ammonium salts which are not easily degradable

Quaternary ammonium compounds of cationic surfactants with undesirable environmental effects such as not being easily degradable are excluded. There are subgroups (e.g. esterquats) with good environmental properties, which are not excluded. Quaternary ammonium compounds are often very toxic to aquatic organisms and if this is combined with the fact that they are not easily degradable, it results in an environmental hazard classification with H411 or H412. Quaternary ammonium compounds are linked to bacterial resistance to antibiotics³³ and may promote certain types of allergies.

Microplastics

Microplastics are very small fragments of plastic material, less than 5 mm. They can be harmful to health and the environment due to their size, surface properties and resistance to degradation. Currently, there are insufficient scientific knowledge and disagreement about the effects of microplastics, especially under natural conditions.

Nordic Ecolabelling applies the precautionary principle and strives to limit the use of microplastics where possible.

Nanomaterial and nanoparticles

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

There is concern among public authorities, scientists, environmental organisations, and others about the insufficient knowledge regarding the

³³ Buffet-Bataillon S., Tattevin, P., Bonnaure-Mallet, M, Jolivet-Goudeon, A. (2012). Emergence of resistance to antibacterial agents: the role of quaternary ammonium compounds—a critical review. *International Journal of Antimicrobial Agents* 39: 381– 389. DOI: 10.1016/j.ijantimicag.2012.01.011

potential detrimental effects on health and the environment^{34,35,36,37,38,39,40,41,42}. Nordic Ecolabelling takes these concerns seriously and applies the precautionary principle to exclude potentially hazardous nanomaterials from products.

Polymer emulsions are considered not as a nanomaterial.

Pigments are finely ground, insoluble particles that are used to give products a specific colour. There are no substitutes that can fulfil pigments' function as colourants in paints and ink, and many pigments consist partly or entirely of nanoparticles. Thus, nano-sized pigments are exempted. Clear evidence-based conclusions of the safety of nano-pigments cannot be drawn, but "exposures to nano-sized pigments that are integrated into polymer, paint or coating matrices are not thought to be significant, and the risks to consumers from such uses are low", according to a literature study commissioned by ECHA.⁴³

Nordic Ecolabelling does not consider titanium dioxide nanoparticles as pigments, and nano-TiO₂ is therefore not exempted.

Synthetic amorphous silica (SAS) is an intentionally manufactured silicon dioxide (SiO₂) form that has been used in industrial, consumer and pharmaceutical products for decades⁴⁴. SAS is a nanomaterial, under the European Commission definition⁴⁵ and is exempted from the requirement due to a lack of alternative substances.

³⁴ UNEP (2017) Frontiers 2017 Emerging Issues of Environmental Concern. United Nations Environment Programme, Nairobi.
https://wedocs.unep.org/bitstream/handle/20.500.11822/22255/Frontiers_2017_EN.pdf?sequence=1&isAllowed=y

³⁵ Parliamentary Assembly of the Council of Europe (2017 (2013)) Nanotechnology: balancing benefits and risks to public health and the environment.
http://assembly.coe.int/CommitteeDocs/2013/Asocdocinf03_2013.pdf

³⁶ Larsen PB, Mørck TAA, Andersen DN, Hougaard KS (2020) A critical review of studies on the reproductive and developmental toxicity of nanomaterials. European Chemicals Agency.

³⁷ SCCS (Scientific Committee on Consumer Safety) (2019) Guidance on the Safety Assessment of Nanomaterials in Cosmetics. SCCS/1611/19.
https://ec.europa.eu/health/sites/health/files/scientific_committees/consumer_safety/docs/sccs_o_233.pdf

³⁸ Mackevica A, Foss Hansen S (2016) Release of nanomaterials from solid nanocomposites and consumer exposure assessment - a forward-looking review. *Nanotoxicology* 10(6):641–53. doi: 10.3109/17435390.2015.1132346

³⁹ BEUC – The European Consumer Organisation et. al (2014) European NGOs position paper on the Regulation of nanomaterials. www.beuc.eu/publications/beuc-x-2014-024_sma_nano_position_paper_caracal_final_clean.pdf

⁴⁰ SweNanoSafe. Nationell plattform för nanosäkerhet. <https://swenanosafe.se/> (2020-05-06)

⁴¹ BEUC – The European Consumer Organisation. Nanotechnology. www.beuc.eu/safety/nanotechnology (2020-05-06)

⁴² Azolay D and Tuncak B (2014) Managing the unseen – opportunities and challenges with nanotechnology. Swedish Society for Nature Conservation.
www.naturskyddsforeningen.se/sites/default/files/dokument-media/rapporter/Rapport-Nano.pdf

⁴³ Hynes J, Novotný T, Nic M, Kocurkova L, Prichystalová R, Brzicová T, Bernatikova S (2018) Literature study on the uses and risks of nanomaterials as pigments in the European Union. European Chemicals Agency.

⁴⁴ https://www.asasp.eu/images/Publications/Nano_-_SAS_factsheet_-_201209.pdf

⁴⁵ [COMMISSION RECOMMENDATION of 18 October 2011 on the definition of nanomaterial \(2011/696/EU\)](http://ec.europa.eu/commission/presscorner/detail/en/COMM_REC(2011)696)

Nitroalkanes

ECHA has assessed nitroalkanes and have concluded that three of them ought to followed up with regulation ⁴⁶. Nitroalkanes can e.g. used in wax mixtures, glue and paint.

NTA (nitrilotriacetic acid) and its salts

NTA is classified as Carc cat. 2 (EU, 2008b) and is therefore already prohibited in requirement O4 due to its classification. However, complexing agents that replace NTA (GLDA and MGDA) contain small amounts of NTA as residues from raw material production (as shown in various safety data sheets for the raw materials). To encourage the transition to MGDA and GLDA, they are allowed to contain impurities of NTA in the raw material at concentrations below 0.2% if the concentration of NTA in the product is below 0.1%.

Organic chlorine compounds, hypochlorites and hypochlorous acid

Organic chlorine compounds, hypochlorite and hypochlorous acid are sometimes used as disinfecting and antibacterial substances and as bleaching agents. Organic chlorine compounds can be, or lead to the formation of, toxic and bioaccumulative substances that are difficult to break down. Chlorine-based bleaching agents generally have undesirable health and environmental properties. Hypochlorous acid is not classified, and hypochlorite have the classification Very toxic to aquatic life (H400) and thus, they are not covered by the general requirement concerning environmentally hazardous substances. However, both pose an environmental risk due to the possibility of organic chlorine compounds forming.

Perfume

Perfumes can be toxic to aquatic organisms, not readily degradable, bioaccumulative and sensitizing. They have no function in office and hobby supplies and are therefore not permitted.

Per- and polyfluorinated compounds (PFAS)

Per- and polyfluorinated substances (PFAS) are used in many types of products due to their water and dirt repellent properties. These compounds constitute a group of substances that have highly problematic intrinsic hazardous properties. They are extremely persistent and accumulate in the body⁴⁷. They are spread all over the globe, from the large oceans to the Arctic, and are found in e.g., wild birds and fish and their eggs. Also, shorter chain compounds (2–6 carbon atoms)

⁴⁶

https://echa.europa.eu/documents/10162/3448017/GMT_316_Nitroalkanes_report_public_25687_en.pdf/a6ed1da8-bfe9-05e0-7c86-abd63972ae21?t=1664347843043&utm_source=echa-weekly&utm_medium=email&utm_campaign=weekly&utm_content=20221005

⁴⁷ Borg, D., Tissue Distribution Studies And Risk Assessment Of Perfluoroalkylated And Polyfluoroalkylated Substances (PFAS), Doctoral thesis, Institute Of Environmental Medicine (IMM) Karolinska Institutet, Stockholm, Sweden 2013
http://publications.ki.se/xmlui/bitstream/handle/10616/41507/Thesis_Daniel_Borg.pdf?sequence=1

have been discovered in nature⁴⁸. The substances in this group are suspected to be endocrine disruptors, carcinogenic and to have a negative impact on the human immune system. Perfluorooctanoic acid (PFOA), Ammonium pentadecafluorooctanoate (APFO) and certain fluoro acids are included in the Candidate List due to being reprotoxic, as well as having PBT properties.

Potential or identified endocrine disruptors substances

Endocrine disruptors (EDs) are chemicals that alter the functioning of the endocrine (hormone) system and consequently cause adverse health effects. The hormone system regulates many vital processes in living organisms and when normal signalling is disturbed, adverse effects may result. EDs raise high concern for their risk of causing serious negative impact on the environment as well as on human health specifically. Special concern is raised for effects on reproduction and development and about possible links to increases in public health diseases. While effects in wildlife populations have been confirmed, evidence is pointing to effects also in humans. By excluding both identified and prioritised potential EDs which are under evaluation, Nordic Ecolabelling ensures a restrictive policy on EDs.

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

Siloxanes D4, D5, D6 and HMDS

Siloxanes are a group of substances with molecular weights from a few hundred to several hundred thousand. Many of them are substances with PBT and/or vPvB properties and are of particular concern because they can accumulate in the environment. Therefore, siloxanes with known problematic properties, specifically D4, D5, D6 and HMDS, are excluded. Other siloxanes or silicones are not included in the list of substances not permitted in the product.

Substances on the REACH Candidate list of SVHC (Substances of Very High Concern)

The Candidate List identifies substances of very high concern which fulfil the criteria in article 57 of the REACH Regulation (EC 1907/2006). The list includes carcinogenic; mutagenic; and reprotoxic substances (CMR, categories 1A and 1B in accordance with the CLP Regulation); and PBT (persistent, bioaccumulative and toxic) and vPvB (very persistent and very bioaccumulative) substances (as defined in REACH Annex XIII). In addition, two more substance groups are included if they are of equivalent level of concern (ELoC) as the ones previously

⁴⁸ Perkola, Noora, Fate of artificial sweeteners and perfluoroalkyl acids in aquatic environment, Doctoral dissertation Department of Environmental Sciences, Faculty of Biological and Environmental Sciences, University of Helsinki, Finland 12.12.2014,
<https://helda.helsinki.fi/bitstream/handle/10138/136494/fateofar.pdf?sequence=1>

mentioned. These are endocrine disruptors and substances which are environmentally hazardous without fulfilling the requirements for PBT or vPvB. Based on these adverse characteristics, Nordic Ecolabelling prohibits substances on the Candidate List. This means that we act ahead of the legislation and ban the substances before they are subject to authorisation and restriction in accordance with REACH.

PBT and vPvB substances in accordance with REACH Annex XIII

PBT and vPvB are abbreviations for substances that are persistent, bioaccumulative and toxic, and very persistent and very bioaccumulative, respectively, in accordance with REACH Annex XIII⁴⁹. This means that they are not biodegradable and that they accumulate in living organisms. Based on these adverse characteristics they pose a threat to the environment and human health. They are prohibited in all Nordic Swan Ecolabel products.

Silver, colloidal silver and nanosilver

Silver is antibacterial agent used in various consumer products, typically in nano form, where it has a greater effect per total amount of silver. Silver is hazardous to health with since it is classified as reprotoxic and under assessment for endocrine disruptive properties. In addition, silver is extremely hazardous to the environment, classified H400 and H410 with an M factor of 10-1000 depending on particle size.

Triclosan

Triclosan is an antibacterial and disinfectant substance used in many different products. There is some concern that the use of antibacterial and disinfectant substances such as triclosan may contribute to increasing the resistance of bacteria to antibiotics. Triclosan is to be considered as bioaccumulative even though a BCF value below 500 has been documented in some sources. Triclosan has been found in various places, e.g. in sewage sludge and wastewater from treatment plants, indicating that the use of triclosan leads to exposure in the environment.

Heavy metals

Heavy metals can be used to e.g. pigments / colour production. For example, it is still normal that there cadmium is used in pigments in hobby paints. Heavy metals have also been found in pigments in hobby products other than hobby paints.

The requirement includes particularly environmentally and health-damaging heavy metals, which are specified in the text. These have a number of undesirable properties such as CMR, toxic, bioaccumulative, harmful to aquatic life (both acute and long-term effects).

⁴⁹ Europaparlamentets och rådets förordning (EG) nr 1907/2006 av den 18 december 2006 om registrering, godkännande och begränsning av kemikalier (REACH)<http://eur-lex.europa.eu/legal-content/sv/TXT/PDF/?uri=CELEX:02006R1907-20160203>

O20 Volatile Organic Compounds (VOC)

Volatile organic compounds* incl. volatile aromatic compounds (VAH) must not be included in the chemical product.

** Volatile organic compounds are defined here as:*

Organic compounds with a vapor pressure above 0.01 kPa, at 20°C,

For products under the EU directive (2004/42/EC) (hobby paints) and raw materials where the vapor pressure is not specified: Organic substances with an initial boiling point lower than or equal to 250°C measured at a normal pressure of 101.3 kPa.

Exceptions:

- Volatile aromatic compounds that are included as denaturants in alcohol or in organic pigments/dyes.

For writing instruments: overhead, whiteboard, felt-tip and marking pens, an exception is made for the following volatile organic compounds in ink:

- Ethanol (CAS no.: 64-17-5)
- Isopropyl alcohol (CAS no.: 67-63-0)
- 1-propanol (CAS no.: 71-23-8) may be included with up to 10% by weight of the chemical product

For hobby paint, glue and tape, up to 3000 ppm of volatile organic compounds that are not VAHs (volatile aromatic compounds) are allowed in the chemical product ("ready to use").

For glue and tape, there is an exception for propylene glycol up to 5% by weight in the chemical product.

- Declaration from the manufacturer/supplier of raw materials about VOC content in the raw material. Appendix 7 can be used.
- Declaration from the manufacturer/supplier of chemical product about VOC content in the chemical product. Appendix 8 can be used.
- Calculation of VOC content in the chemical product, cf. the requirement.

Background to requirement

Several organic solvents are associated with harmful health effects. Organic solvents can be absorbed through the lungs and skin and cause damage to a number of organs. The injuries can be acute or chronic.

Acute harmful effects after inhalation of vapors are shown, such as headaches, fatigue etc. Organic solvents can also irritate the mucous membranes in the eyes, nose and throat. Organic solvents degrease the skin and can cause eczema. After prolonged exposure, organic solvents can cause chronic damage to the brain and nervous system. Certain organic solvents cause other irreparable health damage, such as cancer and reproductive damage (birth defects).

In addition, certain organic solvents contribute to the greenhouse effect, some to photochemical ozone formation and some to the depletion of the ozone layer.

In some cases, volatile organic solvents can be replaced by water, but this often requires an increased addition of preservative.

The intention of the requirement is therefore to exclude the use of volatile organic solvents where possible and to limit the use and only allow less harmful VOCs where there is a need for VOCs. For ink/colours in overhead pens, whiteboard pens and marker pens, volatile organic solvents are needed so that the ink or colour does not dry out too quickly. Therefore, the requirement contains an exception for selected VOCs, which are among the least problematic.

For information, phenoxyethanol (CAS no. 122-99-6) is not a VOC as defined in the requirement, as the vapor pressure is 0.001 kPa at 20°C⁵⁰.

O21 Residual monomers in the polymer

For each synthetic polymer in the chemical product, the quantity of residual monomers in newly produced polymers and its classifications must be stated. The polymer raw material may not contain more than 100 ppm residual monomer in of each classification listed in the table below.

Table: Classification of monomers

Hazard class	Hazard class and category	Hazard code
Carcinogenicity*	Carc. 1A or 1B	H350
	Carc. 2	H351
Germ cell mutagenicity*	Muta. 1A or 1B	H340
	Muta. 2	H341
Reproductive toxicity*	Repr. 1A or 1B	H360
	Repr. 2	H361
	Lact.	H362
Respiratory or skin sensitisation	Resp. Sens. 1, 1A or 1B	H334
	Skin Sens. 1, 1A or 1B	H317
Specific target organ toxicity	STOT SE 1	H370
	STOT SE 2	H371
	STOT RE 1	H372
	STOT RE 2	H373
Acute toxicity	Acute Tox. (oral) 1	H300
	Acute Tox. (oral) 2	H301
	Acute Tox. (dermal) 1 or 2	H310
	Acute Tox. (dermal) 3	H311
	Acute Tox. (inhalation) 1	H330
	Acute Tox. (inhalation) 2	H331
Endocrine disruption for human health**	ED HH 1	EUH380
	ED HH 2	EUH381

* *The classifications apply to all classification variants. For example, the H350 also covers the classification H350i.*

** *See also requirement O19, for additional requirements for potential or identified endocrine disrupting substances.*

- Declaration from the manufacturer/supplier of raw materials. Appendix 7 can be used.
- Declaration from the manufacturer/supplier of chemical product. Appendix 8 can be used.

⁵⁰ [Registration Dossier - ECHA \(europa.eu\)](https://echa.europa.eu) (visited 24-01-2024).

Background to requirement

Polymers are often associated with problematic impurities that can harm the health of both users of the product they are part of and employees in the manufacturing process. At the same time, polymers are not covered by the same registration requirements in REACH as other chemicals. Therefore, there is a special requirement for this group of raw materials.

O22 Preservative

Ingoing substances (see definition in section 4.2) in preservatives must not be classified according to the table below. They must also meet requirement O19.

For products marketed to children as well as office/hobby paints and crayons, there are additional requirements, cf. the table below.

Requirement O17 Classification of the chemical product must always be observed regardless of the amount of preservatives used.

Exceptions and limitations in the chemical product:

- Exempted from this requirement are preservatives used to preserve the chemical product with one or more of the following hazard statements indicated by *** in the table below or combinations thereof (see also limitation of total amount of preservatives).
- The total content of preservatives exempted for these classifications must not exceed 200 ppm (0.0200% by weight).
- Exempted from this requirement are substances (including preservatives) classified H302, H312 and/or H332 up to a total amount of 1000 ppm (0.1000% by weight).
- The amount of preservatives with classifications H302, H312, H332, H373 and/or H317 is allowed up to a total of 1000 ppm (0.1000% by weight).
- Phenoxyethanol is allowed up to 9950 ppm (0.9950 wt %).
- If a combination of phenoxyethanol and ethylhexylglycerin is used, up to 6000 ppm (0.6000% by weight) of phenoxyethanol and up to 600 ppm (0.0600% by weight) of ethylhexylglycerin (which may be self-classified as H332, as a preservative) are allowed.
- All PT 6 isothiazolinones with a specific concentration limit (SCL) of 15 ppm or 360 ppm are limited to 15 ppm in the final product (each CLP Appendix VI entry calculated separately). If the SCL is changed in accordance with CLP Regulation 1272/2008 Annex VI for other PT-6 isothiazolinones, they and their limit values will also be changed and added accordingly.

Table: Classification of preservatives

CLP regulation 1272/2008:		
Hazard class	Hazard class and category	Hazard code
Carcinogenicity*	Carc. 1A or 1B Carc. 2	H350 H351
Germ cell mutagenicity*	Muta. 1A or 1B Muta. 2	H340 H341
Reproductive toxicity*	Repr. 1A or 1B Repr. 2 Lact	H360 H361 H362
Endocrine disruption for human health**	ED HH 1 ED HH 2	EUH380 EUH381
Endocrine disruption for the environment**	ED ENV 1 ED ENV 2	EUH430 EUH431
Persistent, Bioaccumulative and Toxic properties** Very Persistent, Very Bioaccumulative properties**	PBT vPvB	EUH440 EUH441
Persistent, Mobile, and Toxic properties Very Persistent, Very Mobile properties	PMT vPvM	EUH450 EUH451
Acute toxicity	Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 1 or 2 Acute Tox 3 Acute Tox 3 Acute Tox 3	H300 H310*** H330*** H301*** H311*** H331***
Specific target organ toxicity with single or repeated exposure	STOT SEE 1 STOT SEE 2 STOT RE 1 STOT RE 2	H370*** H371 H372*** H373***
Aspiration hazard	Asp. Tox. 1	H304
The prohibitions below only include products for children as well as office/hobby paints and crayons		
Sensitizing by inhalation or skin contact	Resp. Sens. 1, 1A or 1B Skin Sens. 1, 1A or 1B	H334 H317***
Acute toxicity	Acute Tox 4 Acute Tox 4 Acute Tox 4	H302*** H312*** H332***

* *The classifications apply to all classification variants. For example, the H350 also covers the classification H350i.*

* *Complexing agents of the type MGDA and GLDA may contain NTA impurities in the raw material in concentrations of less than 0.2%, if the concentration of NTA in the chemical product is below 0.1%.*

** *See also requirement O19 for additional requirements for potential or identified endocrine disruptors and PBT/ vPvB substances.*

- Declaration from the manufacturer/supplier of raw materials. Appendix 7 can be used.
- Declaration from the manufacturer/supplier of chemical product. Appendix 8 can be used.
- Calculation of preservative content in the chemical product, cf. the requirement.

Background to requirement

Preservatives mean both in-can and film preservatives.

All isothiazolinones for product type 6 (PT 6) that has a specific concentration limit (SCL) of 15 ppm will always be limited to 15 ppm in the final product. The SCL of 15 ppm for isothiazolinones for PT 6 is based on their potential to cause skin sensitization and the SCL ensures that the concentration in the final product is low enough to minimize the risk of sensitization and protect consumers from potential health hazards.

If a combination of phenoxyethanol and ethylhexylglycerine is used, up to 6000 ppm (0.6000 wt%) of phenoxyethanol and up to 600 ppm (0.0600 wt%) of ethylhexylglycerine are allowed. Ethylhexylglycerine can be used as a preservative aid and can be self-classified as H332. For example, ethylhexylglycerine can be used with fenoxietanol to provide preservation and can thereby replace preservative with allergenic effects such as MI.

There is an exception for Acute tox 4 (H302, H312 and H332), H373 and H317 up to a total of 1000 ppm (0.1000% by weight), i.e. 1000 ppm in total for all substances with these classifications. This gives manufacturers more options for using several types of preservatives, while the quantity is still limited. The classification limit for mixtures with Acute tox 4 or H317 is 1%, the permitted amount in the requirement is thus at least ten times lower than the classification limit. The classification limit for mixtures with H373 is 10%, the permitted amount in the requirement is thus at least 100 times lower than the classification limit.

4.9 Perfume and surface treatment

O23 Perfume, aromas and other fragrance substances

Perfume, aromas or other fragrance substances (e.g. in the form of essential oils, plant oils and plant extracts) must not be added to materials in the product.

- Declaration from the applicant. Appendix 2 can be used.

Background to requirement

See requirement O19.

O24 Surface treatment or foliation

When surface treatment or foliation of products, the following must be fulfilled:

Varnishes and other surface treatments (not foils) must comply with requirement O17, O18 and O19.

Foil coatings must comply with requirement O9.

- Declaration from the manufacturer/supplier of surface treatment or foliation that the requirement is fulfilled. Appendix 5 can be used for foils and Appendix 7 and Appendix 8 can be used for other surface treatments.

Background to requirement

The requirement is set to avoid problematic substances - here especially in relation to health.

Most coloured pencil manufacturers often use some form of surface treatment/foiling of the coloured pencil, so that the specific colour is easier to see from the surface of the coloured pencil. It happens that children chew on the end of the pencil/crayon and are thus strongly exposed to possible surface treatment or foiling. Surface treatment and foiling can also be done on other types of products.

4.10 Quality requirements

O25 Hobby paint

1) Viscosity:

The manufacturer of the hobby paint must have a quality procedure to test the viscosity of the paint for each batch to ensure that the desired viscosity is achieved within a defined range. There is an exception here for specific types of colour where the viscosity is intended to be close to that of water, such as liquid watercolour paint.

The viscosity must be storage stable. Storage stability is documented with a storage time test of 2 months/56 days in accordance with ISO 3219-1 and ISO 3219-2.

2) Homogeneity:

The manufacturer of the hobby paint must have a quality procedure to test that the paint is homogeneously mixed (e.g. not grainy) for each batch.

3) Gloss number:

The gloss number of the paint is determined and it must be stated on the product label whether the paint is glossy, semi-gloss, semi-matte, mat, or full mat. The gloss number is measured in accordance with ISO 2813 Gloss: Paints and varnishes. Determination of film for non-metallic paints at 20°, 60° and 85°.

Table: Gloss intervals

Gloss type	Gloss interval		
	20° Gloss	60° Gloss	85° Gloss
Gloss	45-90	70-95+	-
Semi-gloss	5-45	25-70	-
Satin	-	15-25	10-40
Matt	-	2-15	5-25
Dead matt	-	1-10	1-10

- ☒ Description of the quality procedure for testing the viscosity of the paint, which ensures that the desired viscosity is achieved with each batch, indicating which viscosity is aimed for.
- ☒ Description of quality procedure for testing the homogeneity of the paint at each batch.

- ☒ Documentation in the form of a storage test of 2 months/56 days, cf. ISO 3219-1 and ISO 3219-2, which confirms that the paint does not separate during storage.
- ☒ Documentation for the specified gloss type according to ISO 2813 and a label showing that the gloss type is specified.

Background to requirement

It is difficult to determine what is good quality for hobby paint in general.

One reason for this is that there are many different types of hobby paint with different functions and which are used on different surfaces. They include finger painting, poster painting and artist painting. At the same time, the overall quality of the paint is determined by several different factors such as light fastness, colour intensity, covering ability and colour strength.

Light fastness and colour intensity:

Higher colour fastness guarantees the intensity and strength of the colour over a longer period. The colour intensity is determined by the choice of pigment, volume of filler and binder type. The binder is an important factor since acrylic and alkyd binders can generally "carry" less pigment than oil and are thus less intense.

Manufacturers cannot alter this fact. If it also taken into consideration that in terms of coverage pigments behaves differently, a quality comparison should only be made within the same type of paint. Some colour will also be intensified by pigments based on heavy metals, which is not desired in Nordic Swan Ecolabelled products.

Virtually all types of artist's colours are marketed in 2 (sometimes 3) qualities. Artist's colours, or A-quality and studio colours, or B-quality. Not all of them bear these names.

They are also referred to as first and second quality, Artist Colours, etc. The most obvious difference between artist's colours and studio colours is often the price: the studio quality is much less expensive than the artist's colours quality. Studio colours are intended to provide qualitatively fine colours at a relatively low cost. It is up to the customer to choose, based on price and the perceived quality. In a studio colours, expensive pigments such as cadmium and cobalt pigments are not used.

They are replaced by less costly pigments with the same nuance⁵¹. They differ in quality from artist's colours, but in health terms it is preferable to avoid the heavy-metal based pigments.

It can be difficult to set general requirements of the paint's quality in terms of colour fastness and colour quality, as heavy-metal based pigments and price are often opposites. The industry has also developed quality levels that consumers already use.

⁵¹ <http://www.aartdevos.dk/katalog/maleri/farver/>

Homogeneous paint and viscosity:

There is a need, however, to ensure that the paint is of acceptable quality, and not too thin, and can thus be worked on with the hands, a brush or other tool, while ensuring that the paint remains a homogeneous blend in the packaging.

In order to determine the products' viscosity, coverage characteristics, flow mechanisms and sedimentation tendency, various rheological characteristics were measured. Rheology measurements were performed with a Bohlin Rheometer, VOR (Millennium software). Standard geometries were used for the measurements, which were performed in accordance with ISO 3219-1 and ISO 3219-2. This measures the product's viscosity.

The preferred viscosity may vary, however, according to the type of paint, so that the manufacturer of paint for hobby/office use must have a quality procedure to test the paint's viscosity for each batch, to ensure that the required viscosity is achieved within a range given by the manufacturer. The range must match the type of paint in question. The application must state which viscosity it is sought to achieve. Viscosity may be stated as number cP, Brookfield RVF, sp. 4, 10 rpm, 20°C.

To ensure that the paint remains homogeneous in the packaging, it is relevant to set a quality requirement with a storage test showing that the paint does not separate but remains homogeneously blended in the packaging. Storage tests take several months (at least 2 months/56 days) to perform. An accelerated test of storage stability is to place the product in a closed container in a heat cabinet at a raised temperature for a shorter period. Rheological measurements are used as the evaluation parameter for storage stability. This means that the rheology is determined before the start of the storage test and again after completion of the test. Storage stability is measured as a function of viscosity⁵².

Paint gloss:

The perceived gloss of the paint can be adjusted with a higher pigment content or by using different pigments. The paint's gloss is often described with 5 gloss levels, as described in the table. The gloss can be determined according to ISO 2813 Paints and varnishes - Determination of gloss value at 20°, 60° and 85°. The preferred gloss type may be subjective, depending on what the paint is used for. Therefore, a specific gloss level is not required, but instead that the gloss is determined based on ISO 2813 and stated on the label.

O26 Ballpoint and rollerball pens with ink or gel

The writing length of the pen must be fulfilled for the relevant type of pen in the relevant table below. There are two levels of requirements depending on whether a refill is offered or not (see requirement O2). The writing length must be tested according to the standard given in the tables. Ten products must be tested and must include shelf life test according to the standard before the writing length is tested.

For products with refills, the refills must also meet the below requirements for writing length.

⁵² Substitution of biocides in anti-fouling paint for ships with enzymes, MST 2004

Table: Requirements for writing length for ballpoint pens and refills ISO 12757-1.

Ballpoint pens and refills shall be tested according to ISO 12757-1			
		Products without refills	Products with refills
Broad tip	(diameter > 1.05 mm)	1500 m	1000 m
Medium tip	(1.05 mm > diameter > 0.85 mm)	2200 m	1500 m
Fine tip	(0.85 mm > diameter > 0.65 mm)	2600 m	2000 m
Extra fine tip	(0.65 mm > diameter)	3200 m	2500 m

Table: Requirements for writing length for rollerball pens and refills ISO 14145-1.

Rollerball pens and refills shall be tested according to ISO 14145-1			
		Products without refills	Products with refills
Broad tip	(diameter > 1.2 mm)	400 m	200 m
Medium tip	(1.2 mm > diameter > 0.75 mm)	600 m	400 m
Fine tip	(0.75 mm > diameter > 0.55 mm)	750 m	600 m
Extra fine tip	(0.55 mm > diameter)	1000 m	800 m

Table: Requirements for writing length for rollerball pens with gel ink and refill ISO 27668-1.

Rollerball pens with gel ink and refill shall be tested according to ISO 27668-1			
		Products without refills	Products with refills
Broad tip	(diameter > 1.2 mm)	200 m	150 m
Medium tip	(1.2 mm > diameter > 0.75 mm)	350 m	250 m
Fine tip	(0.75 mm > diameter > 0.55 mm)	500 m	400 m
Extra fine tip	(0.55 mm > diameter > 0.40 mm)	800 m	600 m

- Test report according to the requirement showing that the requirement is fulfilled. The tests must be carried out and verified by an independent third party and the analysis laboratory must meet the requirements in Appendix 1.

Background to requirement

For ballpoint and rollerball pens, there are standardized tests for indicating the writing length of the pen, which is a way of expressing the lifespan of the pen.

The requirement must ensure a good lifespan for the specified type of writing instrument and thus ensure that the environmental impact of the writing instrument is reduced compared to similar writing instruments with a shorter lifespan. This means, for example, a more resource-efficient pen.

In the Nordic countries, however, refills for ballpoint pens and rollerball pens are used to a lesser extent than in many other European countries. Nordic

Ecolabelling cannot control/steer whether the consumer actually buys and uses refills. Therefore, there are two levels of requirements, one for products with refills and one for products without refills. For products without refills, a longer writing length is required and thus the primary product (the pens) has a longer lifespan. For products with a refill, the refill must also meet the requirement for writing length.

The chosen test standards for writing length are identical to the standards used in the French environmental mark NF Environnement NF400 for writing instruments. The requirement levels are stricter or identical depending on the type of pen than NF400 (according to the latest version in 2024 which is the 2009 version of NF400).

O27 Markers and felt-tip pens (not whiteboard pens)

1) Drying out:

The pen must be tested for resistance to complete drying out. It must be documented that the pen can be left without its cap for the time period described in the table below, followed by 1 hour with a cap, after which the pen shall still be writable. The test must be carried out on ten products.

Table: Marker pens/felt pens

Marker pens and their ink must have a capacity not to dry out completely within the following period of time		
	Time without cap	Restitution time with cap
Permanent marker pens	5 h	1 h
Non-permanent marker pens	5 h	1 h
Felt-tip pens with washable ink	48 h	1 h
Felt-tip pens with extra washable ink	48 h	1 h

The test is carried out under the following conditions:

The pen without cap is placed horizontally with the tip downwards in a climate chamber with controlled temperature and humidity according to ISO 554 "Standard atmospheres for conditioning and/or testing - Specifications". Temperature and humidity are maintained at 23°C and 50% RH respectively during the test. After the time specified in the table, the pen is tested for writability.

2) Durability:

The pen must be tested for functionality after storage. It must be documented that the pen is still writable after horizontal storage at 40°C +/- 2°C, 55 +/- 5 % RH for 90 days. The test must be carried out on ten products.

- ☒ Documentation in the form of test reports showing that the pen does not dry out and is durable according to the requirement. The analysis laboratory must meet the requirements in Appendix 1.

Background to requirement

Drying out:

The lifetime of the product has an influence on the overall environmental impact. Caps are used on felt-tip pens to prevent them from drying out. However, there is a need to ensure that the pen has a certain resistance to drying out and can thus cope with a certain period of time without a cap, so that the lifespan of the pen is not shortened. There is therefore a requirement that the product must not dry out too quickly when the writing instrument is without a cap.

No standardized tests have been found for resistance to drying out, and therefore requirement levels from the French environmental mark NF Environnement NF400 for writing implements, which are found on different types of writing implements, have been used.

Durability:

The life of the product is also affected by its durability during storage. No standardized tests for this have been found for marker and felt-tip pens. However, according to the standard ISO 12757-1 for ball point pens and the standard ISO 27668-1 for gel ink ball pens, the writing length of ten pens is tested after horizontal storage at 40°C ±2°C, 55 ±5% RH for 90 days. This is the reason why these conditions and length of storage have been chosen before writability is to be tested.

O28 Felt pens (whiteboard pens only)

1) Wiping:

The colour from the pen must be able to be wiped off a whiteboard with a whiteboard sponge.

2) Drying out:

The pen must be tested for resistance to complete drying out. It must be documented that the pen can be left for at least 5 hours without a cap, followed by 1 hour with a cap, after which the pen shall still be writable. The test must be carried out on ten products.

The test is carried out under the following conditions:

The pen without cap is placed horizontally with the tip downwards in a climate chamber with controlled temperature and humidity according to ISO 554 "Standard atmospheres for conditioning and/or testing - Specifications". Temperature and humidity are maintained at 23°C and 50% RH respectively during the test. After 5 hours without a cap and followed by 1 hour with a cap, the pen is tested for writability.

3) Durability:

The pen must be tested for functionality after storage. It must be documented that the pen is still writable after horizontal storage at 40°C ± 2°C, 55 ±5 % RH for 90 days. The test must be carried out on ten products.

- Documentation in the form of test reports showing that the colour from the pen can be wiped off, that the pen does not dry out and is durable according to the requirement. The analysis laboratory must meet the requirements in Appendix 1.

Background to requirement

Wiping:

An important function of a whiteboard pen is that the colour from the pen can be wiped off the whiteboard, therefore testing must be done for this.

For other requirements see under requirement O27.

O29 Pencils and pencil leads

1) Hardness:

The hardness defined by the European scale (HB), cf. the table for pencils and pencil leads must be tested according to ISO 15184. The tested hardness must appear on the pencil or its packaging and for pencil leads on the packaging.

Table: Hardness scale for pencils and pencil leads.

9H	8H	7H	6H	5H	4H	3H	2H	H	F		HB	B	2B	3B	4B	5B	6B	7B	8B	9B			
Hardest	→					Medium						→					Softest						

2) Sharpening:

Does not apply to refillable pencils and their leads.

The pencil must be tested so that the lead does not break when the pencil is sharpened.

The test must be carried out on a minimum of 5 products. If the pencil is already sharpened, the test is started after breaking off the tip. The test (tip breaking + sharpening) takes place three times in a row on the same product.

The test is carried out with e.g. a pencil sharpener, which is defined by the manufacturer/applicant.

- ☒ Test report showing that the hardness has been tested in accordance with the standard specified in the requirement and a photo showing that the hardness appear on the product or its opackaging. The analysis laboratory must meet the requirements in Appendix 1.
- ☒ Test report showing that the lead does not break during sharpening.

Background to requirement

Hardness:

For pencils and pencil leads, the degree of hardness is an important quality parameter. Standardized measurement as well as passing on information about hardness to the user is therefore important.

The hardness of the pencil is defined based on the scale shown in the table in the requirement, which goes from "H" (for hardness) to "B" (for blackness) and "F", which indicates the point midway between HB.

There are no standardized tests for the sole purpose of testing for the hardness of pencils. However, the pencil hardness scale is used to test the hardness of

painted surfaces. This is done in the standard ISO 15184 Paints and varnishes – Determination of film hardness by pencil test. This is a standardized test method used to assess the hardness of coatings using a series of pencils of known hardness. These standards can also be used in reverse, where coatings of known hardness are used to judge the hardness of the pencil.

Sharpening:

Tests must be carried out to show that the lead does not break during sharpening, thereby reducing the life of the product.

No standardized tests have been found to ensure that the lead does not break during sharpening, and the test description from the French environmental label NF Environnement NF400 for writing instruments has therefore been used.

It is recommended to use an "unused" pencil sharpener to perform the test. A used pencil sharpener or one of very poor quality can adversely affect the interpretation of the results.

O30 Pastels, crayons and coloured pencils

1) Quality in relation to properties:

Pastels, crayons and coloured pencils must be tested for satisfactory quality in relation to the characteristics for which the product is marketed, either directly or indirectly via product type. The test may be the applicant's internal quality test, a consumer test with at least 10 independent test persons, or a test to compare with an equivalent product, such as a triangle test. The test must show that at least 80% are satisfied with the product.

2) Only for colored pencils, sharpening:

In addition, for coloured pencils, testing must also be carried out to ensure that the lead does not break when the pencil is sharpened. See under requirement O29.

- Description of the test, including the method selected and test result. If a consumer test is used, a copy of the completed and signed test reports must be submitted. In addition, a report describing which test persons and how many were asked, as well as a summary of the results must be attached.
- For coloured pencils in addition: Test report showing that the lead does not break during sharpening

Background to requirement

Quality in relation to properties:

Within the group of chalk, crayons and coloured pencils, there are products of very different types and materials composition. Different application techniques are used. This composition and application to achieve different expressions makes it difficult to set uniform quality requirements of crayons and coloured pencils. However, manufacturers have a clear idea of which properties their products have and it is therefore possible to require that a consumer test be carried out to assess whether these properties are also found for the product.

There are examples of products that are marketed with the following characteristics:

Oil pastels with a "soft and creamy consistency". "Pastels can be diluted with turpentine or oil and applied with a brush" or "water-soluble crayons".

Further information on various characteristics can be seen in the table below.

Table: Qualitative characteristics.

	Waterproof pencils	Watercolour pencils, Aquarelle pins	Pastels	Charcoal, monochrome pins	Pencils
Pigments	High organic and inorganic pigments in high concentrations			High quality pigments in high concentrations	Graphite, sometimes the addition of soot
Fastness	High light fastness, but depending on colour			Highest lightfastness	
Colour Palette	Opposite coloured pencils for school and preschool wider colour palette. The respective colours can be purchased individually at the highest long-term colour match.			-	-
Lead diameter	Unlike standard coloured pencils usually larger lead diameter (depending on the application between 2 mm and 6 mm)				Depending on the hardness. The diameter soft mines are usually larger than the hard mines.
Requirements for substrates	Low	With certain techniques suitable substrate is a prerequisite.	Rough, porous surface necessary. Whenever possible, use special paper. Colour smear does not adhere to smooth surfaces.	Low	
Adhesion to the substrate	High	High	Low (colour application must be fixed)	High, easily correctable	

Sharpening:

For coloured pencils, in addition to tests for quality in relation to properties, tests must be carried out to show that the lead does not break during sharpening.

See more under requirement O29.

O31 Office and hobby glue

Based on quality tests it must be documented that the glue is of good quality, for use in the operation and the materials from which the product is marketed for on the product and product sheet, or for which the product is marketed elsewhere.

The product quality is here defined by the following 4 parameters:

- Glue efficiency expressed as an attachment in conjunction with the quantity used.
- Glue consistency (is it too thin, too thick or lump it)
- The glue is easy to apply.
- The glue can be closed so that it does not dry out after opening.

Test setup:

The Ecolabelled product must be tested against a reference product. The reference product must be an equivalent product from another manufacturer on the Nordic market. Choice of reference product must be motivated in the test report.

The test must be carried out as laboratory test laboratory complies with requirements in Appendix 1. The efficiency test must be performed with at least 20 replicates and in 80% of these replicates the ecolabelled product should be at least as good as or better than the reference product. Selection of the test must be justified in relation to how it tests for the properties the glue is marketed with.

- Test report showing that the requirement is fulfilled.

Background to requirements

Office and hobby glue can be found with different functions that can be used for different types of materials. There are glue sticks, fluid glue and melt glue, and therefore different ways of applying these glues (directly or with a spatula or brush). The quality and characteristics of the glue must therefore be viewed in relation to the function for which the glue is marketed.

Good adhesion to the stated material for which the glue can be used, and functional packaging that allows the glue to be easily applied, are parameters that are important to the perceived quality of the glue. There are standardised tests of adhesion for different materials.

O32 Office and hobby tape

It must be ensured that the tape is of good quality in accordance with the function for which it is marketed. The following requirements must be fulfilled in terms of the function for which the tape is marketed.

Office tape:

- Adhesion to steel measured according to ISO 29862: of at least 1.5 N/cm
- Tensile strength measured according to ISO 29864: of at least 2.5 daN/cm
- Elongation at break measured according to ISO 29864: of at least 20%

Decorative tape/correction tape:

- Adhesion to steel measured according to ISO 29862: of at least 1.5 N/cm
- Tensile strength measured according to ISO 29864: of at least 2 daN/cm
- Elongation at break measured according to ISO 29864: of at least 20%

Packing tape:

- Adhesion to steel measured according to ISO 29862: of at least 4 N/cm
- Tensile strength measured according to ISO 29864: at least 300 N/100 mm width
- Elongation at break measured according to ISO 29864: of at least 100%

Removable tape:

- Breaking strength measured according to ISO 29864: of at least 2 daN/cm
 - Elongation at break measured according to ISO 29864: of at least 20%
- Test report for tests specified in the requirement showing that the requirement is fulfilled according to the function for which the tape is marketed. The analysis laboratory must meet the requirements in Appendix 1.

Background to requirement

Besides the function of sticking together materials such as paper, carton or other material types, the various types of tape also have other characteristics. They can be transparent, flexible, or have a decorative effect. It is also significant to the perceived quality of the tape that the tape leaves the tape reel when the tape is pulled, and that it does not break too easily when the tape is pulled (elongation at break). There are also examples of moveable tape, which means that the tape can be moved, but still retain its adhesion. There are standardised international test standards to describe the most important tape characteristics, such as adhesion strength and tensile strength.

Adhesion strength is expressed in Newton per 10 mm tape and rounded to the nearest 0.1 N/10 mm in accordance with ISO 29862. However, ISO 29862 shows that the result of this test is not directly comparable for different products with different types of carriers. The test does express adhesion, however, and it will therefore be appropriate to require that acceptable adhesion is achieved, and possibly also that better adhesion is achieved for tape with more robust functions, such as packing tape.

Cf. ISO 29864 - Tape - Measurement of breaking strength and elongation at break, to measure the tape's characteristics in relation to tensile strength in the unit of Newton per 10 mm and elongation at break is measured by stating the percentage elongation of the tape from the starting point.

O33 Eraser

The eraser should be tested for satisfactory performance/quality for removing the pencil line from the paper without colour from the eraser rubs off on the paper. The test may be the manufacturer's internal quality testing, a consumer test with at least 10 independent testers or test, which compares with a similar product, e.g. a triangle test. In consumer tests, the test must show that at least 80% are satisfied with the product.

- Description of the test, including the method selected and test result. If a consumer test is used, a copy of the completed and signed test reports must be submitted. In addition, a report describing which test persons and how many were asked, as well as a summary of the results must be attached.

Background to requirement

Eraser can have varying quality which depends on the ratio between the filling thwarts (often chalk) and rubber. In addition, some erasers contain colours that rub off in use.

O34 Office supplies in monomaterial

The office supply must be tested for satisfactory quality in relation to the characteristics for which the product is marketed, either directly or indirectly via product type. The test may be the applicant's internal quality test, a consumer test with at least 10 independent test persons, or a test to compare with an equivalent product, such as a triangle test. The test must show that at least 80% are satisfied with the product.

- Description of the test, including the method selected and test result. If a consumer test is used, a copy of the completed and signed test reports must be submitted. In addition, a report describing which test persons and how many were asked, as well as a summary of the results must be attached.

Background to requirements

Within the group of office supplies in monomaterial, there are products of widely varying types and materials. This makes it difficult to establish uniform quality requirements for this group of products. However, manufacturers have a clear idea of which properties their products have and it is therefore possible to require that a consumer test be carried out to assess whether these properties are also found for the product.

4.11 Consumer information

O35 Information on refills

It must be recommended that refill is used for the product types where it must be offered according to requirement O2. This information must appear on the product, label or packaging.

- Photo of product, label or packaging.

Background to requirement

The criteria require a refill option for specific products in this product group. The requirement is to achieve a longer lifespan for the products and thus reduce the overall environmental impact in relation to the product's achieving function. In order to utilise the refill option, it is important that information about this appears in any label or packaging.

O36 Information on felt-tip and marker pens

For marking and felt-tip pens (incl. whiteboard pens), it must be stated on the product that it must be stored horizontally. For felt-tip pens, which are sold in packs of many different colours (10 pieces or more), the information can be found on the primary packaging.

- Photo of product or packaging.

Background to requirement

The requirement is to achieve a longer lifespan for the products and thus reduce the overall environmental impact in relation to the product's achieving function. The lifespan of the product is often reduced if it is not stored horizontally.

For felt-tip pens, which are sold in packs of many different colours (many colours are defined here as 10 or more), pens are typically stored in the primary packaging by consumers. Therefore, for this type of product, there is an option to have the information on the packaging instead of on each individual pen.

4.12 Packaging

O37 Plastic

Polyvinyl chloride (PVC), polyvinyl dichloride (PVDC), oxo -degradable plastic and biodegradable plastic must not be included in the packaging or labels on the packaging.

- Declaration from the packaging manufacturer/supplier.

Background to requirement

Biodegradable and oxo -degradable plastics must not be used, as they contaminate the other plastic streams for recycled plastic in the Nordic countries.

Regarding PVC and PVDC please see under requirement O5.

O38 Metal

Metal may not be used in the packaging.

- Declaration from the applicant.

Background to requirement

Production of metal packaging requires a lot of energy, and thus has a higher CO₂ emission than plastic or cardboard packaging. Therefore, metal packaging is not permitted.

O39 Design of packaging

Primary packaging* must consist of monomaterial*.

The type of material must be stated (e.g. cardboard or PE).

It must be possible to recycle the material in the existing waste and resource systems in the Nordics today.

The material must be 100% recycled**. However, it is permitted for paper- and cardboard-based packaging to contain 100% of FSC- or PEFC-certified fiber raw materials and/or post-consumer/commercially recycled material.

Labels on plastic packaging must consist of the same polymer type as the packaging.

* See definitions in section 4.2.

** Recycled material is defined in section 4.2.

- Declaration from the applicant that the packaging consists of monomaterial, as well as information on the type of material.

- Documentation that the material is 100% recycled:

- Documentation that the material is certified with EUCertPlast, RecyClass, Global Recycling Standard or Recycled Claim Standard. If

the certification does not cover that the material is 100% recycled, this must be stated and must be supplemented with documentation that the material is 100% recycled.

- or
- Declaration from the manufacturer of the material that it is 100% recycled. In addition, the manufacturer must disclose the primary sources of the recycled materials (e.g. collected consumer packaging, residual waste from the manufacturer of xx product), as well as disclose the proportion of pre-consumer/commercial and/or post-consumer/commercial recycled material.

- For paper and cardboard: Valid FSC/PEFC traceability certificate and/or documentation that paper/cardboard is recycled.

Background to requirement

It is only permitted to use primary packaging for the Nordic Swan ecolabelled product if monomaterial is used and it can be documented that it consists of pre- and/or post-consumer/commercially recycled material.

Recyclability is an important step in the transition towards a circular economy. Here, the possibility is given that materials can remain in the resource cycle, whereby the use of virgin resources is reduced. Whether a material is recycled depends on many factors, such as sorting possibilities in each country or municipality and how the consumer ultimately sorts the waste. However, Nordic Ecolabelling has the opportunity to promote the possibility of recycling of materials from packaging by setting design requirements that support this process.

The material in the packaging must be recyclable in the existing waste systems in the Nordic countries today. Incineration with energy utilization is not considered material recycling. The EU's circular economy action plan focuses on recovery and recycling, especially with regard to packaging material. Collection of waste can either lead to a high level of material recovery, where valuable materials are returned to the economy, or to an inefficient system, where recyclable waste largely ends up in landfills or sent for incineration. The EU has also developed a plastic strategy which, among other things, focuses on making plastic recycling more profitable and working towards global solutions and standards to promote plastic recycling⁵³.

For cardboard/cardboard/paper packaging, it is also possible to use FSC- or PEFC-certified fiber raw materials. For more background on FSC or PEFC certification see under requirement O12.

O40 Information on sorting for recycling

The packaging must be marked with pictograms recommended by national recycling systems.

⁵³ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Closing the loop – An EU action plan for the Circular Economy, COM(2015) 614 final, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614>

If the products are sold in the Nordic countries, pictograms developed by the joint European association EUPicto (www.eupicto.com) must be used.

- Photo of packaging or artwork with pictograms.

Background to requirement

In order to stimulate the sorting of packaging for recycling, there is a requirement for pictograms regarding how it should be sorted for recycling. The waste phase is affected by many factors, such as sorting options in each country or municipality and how the consumer ultimately sorts waste. However, Nordic Ecolabelling can generally stimulate increased recycling of packaging material by setting requirements that support the possibility of recycling.

4.13 Licence maintenance

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

O41 Customer complaints

The licensee must guarantee that the quality of the Nordic Swan Ecolabel product or service does not deteriorate during the validity period of the licence. Therefore, the licensee must keep an archive over customer complaints.

Note that the original routine must be in one Nordic language or in English.

- Upload your company's routine for handling and archiving customer complaints.

Background to requirement

Nordic Ecolabelling requires that your company has implemented a customer complaint handling system. To document your company's customer complaint handling, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for customer complaint handling, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the customer complaint handling is implemented in your company as described. The customer complaints archive will also be checked during the visit.

O42 Traceability

The licensee must be able to trace the Nordic Swan Ecolabel products in the production. A manufactured / sold product should be able to trace back to the occasion (time and date) and the location (specific factory) and, in relevant cases, also which machine / production line where it was produced. In addition, it should be possible to connect the product with the actual raw material used.

You can upload your company's routine or a description of the actions to ensure traceability in your company.

- Please upload your routine or a description.

Background to requirement

Nordic Ecolabelling requires that your company has implemented a traceability system. To document your company's product traceability, you must upload your company's routine describing these activities. The routine should be dated and signed and will normally be part of your company's quality management system.

If your company does not have a routine for product traceability, it is possible to upload a description of how your company perform these activities. During the on-site visit, Nordic Ecolabelling will check that the product traceability is implemented in your company as described.

5 Changes compared to previous generation

Below is an overview of changes from criteria generation 4 to 5.

Comparison of requirements for Office and hobby articles in criteria generation 4 and criteria generation 5.

Requirements generation 5	Requirements generation 4	Same requirements	Change	New requirement	Comment
O1	O1		x		Minor changes.
O2	O4		x		For pens alternative option in O27.
O3	O27	x			
O4	-			x	Now an alternative to refill is longer writing length.
O5	O22		x		Added requirement for office supplies in monomaterials.
O6	O2		x		Proportion of recycled plastic increased from 30% to 60%.
O7	-			x	
O8	-			x	
O9	O21		x		Added requirements for more substances.
O10	O23		x		Requirements for more PAHs.
O11	U18		x		Requirements updated to the latest version of the Nordic Ecolabelling forest requirements.
O12	O17		x		Requirements updated to the latest version of the Nordic Ecolabelling forest requirements.
O13	-			x	
O14	O3	x			
O15	O20	x			
O16	O1		x		Now separate requirement for chemical products.
O17	O6		x		The requirement tightened with requirements for more substances.

U18	O7		x		The requirement tightened with requirements for more substances.
O19	O8, O10, O11, O12, O15 and O16		x		The requirement tightened with requirements for more substances.
O20	O9	x			
O21	O13		x		The requirement tightened with requirements for more substances.
O22	O14				Minor change regarding isothiazolinones with a specific concentration limit.
O23	O24	x			
O24	O25		x		The requirement now applies to all products. Requirement for prohibition of CMR classified substances also added.
O25	O28	x			
O26	O31		x		The requirement has been tightened with extended requirements for testing.
O27	O32		x		The requirement has been tightened with extended requirements for testing.
O28	O33		x		The requirement has been tightened with extended requirements for testing.
O29	O34		x		The requirement has been tightened with extended requirements for testing.
O30	O35		x		The requirement has been tightened with extended requirements for testing.
O31	O29	x			
O32	O30	x			
O33	O36	x			
O34	-			x	
O35	O37	x			
O36	-			x	
O37	O22		x		The requirement has been tightened with a ban on oxo - degradable plastics and biodegradable plastics.
O38	O3	x			

O39	O5		x		The requirement has been tightened in that the packaging must be monomaterial, recycled material, recyclable material and labels on plastic packaging in the same polymer type.
O40	-			x	
O41-O42	O39-O45		x		The requirements have been updated according to the latest guidelines in Nordic Ecolabelling.
-	O26		x		The requirement has been deleted.

Regulations for the Nordic Ecolabelling of products

When the Nordic Swan Ecolabel is used on products the licence number shall be included.

More information on graphical guidelines, regulations and fees can be found at www.nordic-swan-ecolabel.org/regulations

Criteria version history

Nordic Ecolabelling adopted version X.X of the criteria for XX on DAY MONTH YEAR. The criteria are valid until DAY MONTH YEAR.