



natureplus e.V.

Guideline 0605

Casein-Based Paints

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for the awardance of the eco-label

0 Introduction

The International Association for Sustainable Building and Living – natureplus e.V. – has set itself the goal, through the awardance of a quality label (eco-label), of promoting the use of those construction products which are especially suited to achieving the goal of economicsustainability. The three classic pillars of sustainability (the environment, social aspects and the economy) are reflected in natureplus's the three fundamental requirements: the environment, health and functional quality.

Every construction activity encroaches upon the natural environment and is connected with the consumption of limited resources. Our responsibility towards future generations requires us to undertake every effort to reduce these encroachments to the lowest level possible and to limit our use of resources to a necessary minimum. In view of the foreseeable exhaustion of the reserves of fossil fuels, for example, and the dangers to the earth's climate, such an approach is the only possible means to ensure sustainable and socially equitable development. For the building sector this means promoting the use and application of construction products which help to minimize the consumption of fossil fuels and limited resources. It is natureplus's intention to help promote the commercial success of those products which fulfil these demands.

Energy-saving building methods and the avoidance of uncontrolled ventilation facilitates the accumulation of volatile chemical compounds in the interior air that are emitted by building products and the inventory contained within the building. This presents a(n) (avoidable) danger to the health of the occupants. Also, the accretion of chemical contaminants (especially phthalates/plasticisers) from building products on house dust, the increasing use of biocides in everyday products and the dangers posed by mould growth due to negative product characteristics give rise for concern. An increasing proportion of the population are exhibiting reactions, such as allergies, to the negative health-related effects of these construction products. natureplus therefore evaluates the compatibility of construction products, especially in the usage phase, according to strict standards in order to actively promote those materials which pose no risk to health and are, in addition, conducive to a healthy room climate.

The natureplus®-Eco-label is an award for construction products which meet the highest standards of sustainability by exhibiting the best possible performance in terms of the environment, health and functionality. Scope of the assessment is the building material as raw material and as component. Only the best products in a particular product group are eligible for certification in order to act as an orientation for all building professionals and consumers towards the promotion of a culture of sustainable building. The natureplus®-Eco-label has anticipated the requirements of construction products of the European Construction Products Directive EU CPR 305/2011: In the future this regulation requires a declaration of performance with evidence of the sustainable use of natural resources and of compliance with requirements in terms of low impact, over their entire life cycle, on the environmental quality or on the climate, energy-efficiency and the hygiene, health and safety of people. The natureplus®-Eco-label already provides these proofs of performance in relation to the essential characteristics of construction products. This is gauged by natureplus according to criteria and requirements which, as a rule, far exceed the legal requirements and as a minimum comply in each case with the strictest recognised standards applicable.

The natureplus®-Eco-label is classified as a Type I environmental label as per ISO 14024, taking into consideration the EU Ecolabel Regulation and the EMAS regulation on environmental auditing, and is valid across the whole of Europe according to uniform criteria. The pre-requirements for a construction product to be certified with the natureplus®-Eco-label are its especially high performance characteristics in terms of the environment, health and sustainability. The main focuses are on the protection of limited resources by the minimisation of the use of petrochemical substances, sustainable raw material extraction/harvesting, resource-efficient production methods and the longevity of the products. Therefore, building products made from renewable raw materials, raw materials which are unlimited in their availability or from secondary raw materials will be favoured for certification.

I Application Areas

The following criteria contain the requirements for the awardance of the natureplus eco-label for casein-based paints in powder form for interior applications. Casein based paints in liquid form (water-based) are covered in the natureplus award guideline RL0601 "Plant-Based Interior Wall Paints". This awardance guideline is to be applied exclusively to the named products.

2 Award Criteria

The prerequisite for a product to be awarded the natureplus® quality label in accordance with these guidelines is compliance with the following award guidelines:

- GL-5001 Chemicals Directive
- GL5002 Origin of Wood and Wood Production
- GL-5003 Nature Conservation when Exploiting Mineral Resources
- GL-5004 Transparency and Social Responsibility
- GL-5010 Low-emission building products
- GL-5020 Climate compatibility and energy efficiency

2.1 Functional Suitability

The product must be classified according to the requirements of DIN EN 13300 (or a comparable standard).

For a transitional period the German standard DIN 53778 (or a comparable standard) may also be applied. Its yield (covering power) and its wet abrasion resistance should be at least Class 3 as per DIN EN 13300.⁽¹⁾

The manufacturer must provide proof that the product complies with these requirements by submitting appropriate test results and expert assessments.

⁽¹⁾ If the testing regulations of DIN EN 13300 are not applicable to the product characteristics, it is possible to agree a modification of the testing method with natureplus.

2.2 Composition, Forbidden Substances, Substance Restrictions

The product must be made to at least 99M-% from renewable and mineral raw materials and water.

Only lime-casein and borax-casein are permitted as binding agents. The use of preservatives/preserving agents is forbidden.

With regard to the recommended application, the amount of anorganic white pigments of artifical origin is restricted to 38 g/m².

The following substances must not be added to the product:

- softening agents (according to VdL-GL 01)
- glycol compounds
- APEOs (alkylphenol ethoxylates)

- halogenic organic compounds
- organic tin compounds
- azo dyes resulting in carcinogenic amines
- biocides not used for in-can conservation (film preservatives)
- halogenated isothiazolinones
- formaldehyde releasing substances

The product must not be prepared with pigments and siccatives based on lead, cadmium, chrome VI and their compounds. Pigments posing ecological and toxicological problems, e.g. Naples yellow, are not permitted.

No preservatives may be used.

The product is subject to laboratory analyses as laid down in section 3 and has to comply with the limit values stated therein.

2.3 RawMaterial Sourcing, Production of Preliminary Products, Production

When using mineral raw materials, the requirements of RL-5003 must be complied with.

If titan dioxide is employed, it must correspond with EU-GL 92/112/EWG.

A certificate of origin must be provided for all renewable raw materials.

Proof must be provided of the measures taken to avoid the incidence of bacterial contamination (industrial hygiene) in the selection of raw materials and the production process.

Dairy waste water must comply with the applicable limits (analogue to the framework document for waste water management regulations (Rahmen-AbwVwV) according to § 7a of the German Water Resources Act (Wasserhaushaltsgesetz WHG), 1993, appendix 3, milk processing).

2.4 Usage

The product must not exhibit any unpleasant or foreign smells or odours. The emissions during use have to be in compliance with the limit values according to section 3.

Emissions must not exceed the natureplus limits according to section 3 during the use phase. (see section 3 and RL5010)

2.5 Recycling/Disposal

The products are to be labelled with indications for disposal of paint containers and paint residues, along with cleaning advice for all tools used.

2.6 Ecological Parameters

All products in this product group must be manufactured in such a way that the ecological parameters listed in RL 5020 are fulfilled.

2.7 Declaration

The product packaging should display a full declaration of the input materials listed, analogue to the EU-Cosmetic Regulations, according to the declining mass percentage. If it is not possible to display this information directly on the product packing, it should be provided with the product in a technical datasheet or sales leaflet (in English or in the national language). If intermediate/preliminary products or formulations are used as input substances and the proportion present in the final product is >0.1 M-%, then all the substances used within these must also be taken into account for the declaration.

For naming the input materials as part of the declaration the following applies:

- More than 1 M-% - designation of the substance in question
- Less than 1 M-% - at least a functional designation (e.g. "moth proofing agent")

Furthermore, it is obligatory to provide the following information in a suitable form to the consumer or user (e.g. online):

- Instructions for use and safety precautions
- Indications for storage and disposal
- Batch numbers
- City/town and country of production
- Indication of geographical origin of the key input material

When using ingredients with an environmentally hazardous potential, the manufacturer must indicate at an appropriate place which measures are to be taken within the framework of dismantling and demolition work to protect the environment (e.g. controlled dismantling).

Additionally, the following product-specific information must be made available to the consumer or user.

- pH-value
- Consumption data per m²
- Durability, storage properties, necessary storage conditions
- Yield (surface coverage power) according to DIN EN 13300
- Wet abrasion resistance according to DIN EN 13300
- For paints in powder form – the packaging must contain instructions for mixing the paint

2.8 Processing and Installation

No further requirements in this section.

2.9 Packaging

The packaging used must be recyclable. The manufacturer must belong to a recycling system, if one exists for the corresponding material.

Paper and cardboard packaging must be made from recycled paper. Alternatively, paper from sources as per GL-5002 is also permitted.

Plastic packaging must be made from polyolefins. PET, polystyrene or polycarbonates are allowed exceptionally in reasonable cases.

PVC packaging is generally not permitted.

Packaging must not contain biocides.

The natureplus certification mark has to be printed on the packaging after it has been awarded.

3 Laboratory Tests

The products are subject to laboratory analyses to test for harmful substances and undesirable ancillary ingredients. A representative sample is collected during the production audit. If the sample collection cannot be conducted by a natureplus examiner, an independent person designated by natureplus can collect the sample. For products with different sizes but the same composition, a single sample is sufficient.

3.1 Volatile Organic Compounds VOC / TVOC

To check the emission of VOC and to determine the TVOC and TSVOC, an emission chamber test is carried out with the product. Measurements are usually performed after 3 and 28 days. If a low VOC emission is to be expected, a termination measurement can also be carried out after 7 days. The test-chamber examination is performed according to the current version of natureplus guideline 5010. The product must comply with the limit values specified in guideline 5010.

3.2 Element Analyses

The product is subject to an element analysis to determine the content of harmful elements and to check for undesirable contaminations. The measurements have to be in compliance with the limit values. The analysis is performed according to the current version of the test method TM-02 metals.

Element	Limit value [mg/kg]
Arsenic (As)	≤ 5
Cadmium (Cd)	≤ 1
Cobalt (Co)	≤ 20
Mercury (Hg)	≤ 1
Nickel (Ni)	≤ 20
Lead (Pb)	≤ 15
Zinc (Zn)	≤ 150

3.3 Other Analyses

Chromium VI

Test parameters	Limit values	Unit	Method
Chromium VI (Cr VI)	≤ 1	mg/kg	TRGS 613

Halogenic organic compounds

Test parameters	Limit values	Unit	Method
Halogenic organic compounds: AOX/EOX	≤ 1	mg/kg	TM-03 Halo

pH value

Test parameters	Limit values	Unit	Method
pH value	≤ 12,75		ISO 10390

Odour

Test parameters	Limit values	Unit	Method
Odour	≤ 3	Odour intensity	TM-04 Odour

4 Appendix

Test methods

TM-01 VOC : Volatile Organic Compounds VOC/TVOC, formaldehyde, acetaldehyde and TSVOC: DIN EN ISO 16000 series expanded by the natureplus implementation rules.

TM-02 Metals: ICP-MS measurements according to DIN EN ISO 17294-2, supplemented with the natureplus implementation rules and a sample preparation adjusted to the issue analysed.

TM-03 Halo: Halogenic organic compounds after combustion, determined by microcoulometry according to the natureplus implementation rules "AOX/EOX".

TM-04 Odour: natureplus implementation rules "odour intensity", 6-degree grading scale 24h after loading the test chamber

TM-05 Pesticides: DFG S 19 extended by natureplus implementing regulations

TM-08 Foreign fibres and foreign substances: scanning electron microscopy SEM

TM-09 Monomeric isocyanates: 24h after test chamber loading

Appendix Test parameters for paints containing coloured pigments and tinting paints

If the composition of the coloured paints or tinting paints (with the exception of the colorant components) is identical to the unpigmented / white paints, then they will only be tested for the following parameters:

- Metals and Metalloids (according to each colour)
- Carcinogenic Amines from Azo dyes/colorants (if required/suspected)

Test parameter	Limit value	Unit	Method
Carcinogenic Amines from Azo dyes	≤ 10	mg/kg	according to LFGB

Simplified Procedure

The pigments are directly analysed for their metal content. The manufacturer must supply a list of all the pigments employed (brand name, chemical structure, CAS-number, safety data sheet). These pigments are chemically classified and combined into logical groups for mixed samples.

Content Analysis

The elements arsenic, lead, cadmium, mercury and thallium will be solubilised through complete dissolution and measured according to the natureplus implementation procedure. The decomposition of pigments based upon organic colorants is accomplished by means of a pressure digestion system using nitric acid. Pigments based upon inorganic starting compounds will be solubilised by means of a pressure digestion system using a nitric acid/hydrofluoric acid mixture.

The applicable threshold values for this analysis are calculated based upon the threshold values of this guideline for the colourless product according to the following formula:

Threshold value of the element⁽³⁾ = (100 / divided by the number of pigments in the mixed sample) / average percental input of the colorant.

(3) Threshold value Thallium 2 mg/kg. For other element limits see the table under section 3.

If the threshold value is exceeded, an analysis of the individual pigments must be performed.

Eluate determination

For the metals antimony, barium, chrome, cobalt, copper, nickel and tin, which are classified as harmful, the analysis of the soluble proportion is to be preferred over the analysis of the total content. The eluate is produced as per DIN EN 71 Part 3 by means of the elution method using a gastric acid-substitute solution.