



natureplus e.V.

Guideline 0604

Mineral-Based Exterior Wall 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 award of the natureplus Eco-label for mineral-based wall paints (silicate paints) for exterior applications according to DIN 18363 2.4.1.

Paints which are advertised for use for both exterior and interior applications must be evaluated according to the requirements of GL 0602.

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
- 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

Products that are awarded the natureplus Eco-label must fulfil very high functional suitability standards. Manufacturers may prove compliance with these requirements by reference to appropriate official standards and guidelines.

The following requirements must, without exception, be fulfilled:

- Diffusion-equivalent air layer thickness EN ISO 7783-2, Classification I, High water-vapour permeability
- Water-vapour transmission rate EN 1062-1, Classification III, Low water-permeability

2.2 Composition, Forbidden Substances, Substance Restrictions

The proportion of mineral raw materials and water in the product must at least 95 mass%.

The proportion of all organic constituents (e.g. acrylates) must not exceed 5 mass%.

The proportion of organic solvents must not exceed 0.5 M-%.

The use and addition of biozides is not permitted.

The following product additives are prohibited:

- Softeners (According to VdL Guideline 01 (VdL – German Paint Industry Federation))
- Glycol compounds
- APEO's (alkylphenol ethoxylates)
- Halogen organic compounds
- Tin organic compounds
- Azo colorants that are capable of decomposing carcinogenic amines
- Formaldehyde decomposition agents

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.

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

The requirements relating to coloured products are to be found in the appendix: Coloured Products.

2.3 RawMaterial Sourcing, Production of Preliminary Products, Production

A certificate of origin must be provided for all input components which constitute a proportion of >25% of the product.

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

2.4 Usage

The product must be capable, without the addition of biocides, of retarding the growth of algae and fungus.

In a solid state, the product must not exhibit any unpleasant or foreign smells or odours.

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 (eg. 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.

- Spreading rate/ Coverage in m² / Litre
- Shelf life, storage properties, necessary storage conditions

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 TSOC, 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) | ≤ 0,5 |
| Cobalt (Co) | ≤ 20 |
| Mercury (Hg) | ≤ 0,1 |
| Nickel (Ni) | ≤ 10 |
| Lead (Pb) | ≤ 15 |
| Tin (Sn) | ≤ 10 |

3.3 Other Analyses

Halogenic organic compounds

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

Halogenic organic compounds

| Test parameters | Limit values | Unit | Method |
|-------------------------------|--------------|-------|------------------------------------|
| Aromatic hydrocarbons (total) | ≤ 20 | mg/kg | Headspace GC/MSanalog EN ISO 17895 |

CMR- individual aromatics

C = carcinogenic; M = mutagenic; R = toxic for reproduction; classified according to German Prohibited Chemical Substances Regulations (GefStoffV)

| Test parameters | Limit values | Unit | Method |
|----------------------------------|--------------|-------|------------------------------------|
| Polycyclic aromatic hydrocarbons | ≤ 2 | mg/kg | Headspace GC/MSanalog EN ISO 17895 |

Total VOC (TVOC)

| Test parameters | Limit value | Unit | Method |
|------------------|-------------|-------|------------------------|
| Total VOC (TVOC) | ≤ 500 | mg/kg | TM-15 TVOC (Headspace) |

Monomer Acrylate

| Test parameters | Limit values | Unit | Method |
|------------------|--------------|-------|-------------------------------------|
| Monomer Acrylate | ≤ 10 | mg/kg | Headspace GC/MS analog EN ISO 17895 |

Phthalate Ester

according to VdL guideline 01 in case of need

| Test parameters | Limit values | Unit | Method |
|-----------------|--------------|-------|------------------------------|
| Phthalate Ester | ≤ 1 | mg/kg | Solvent extraction und GC/MS |

Free Formaldehyde

| Test parameters | Limit values | Unit | Method |
|-------------------|--------------|-------|--|
| Free Formaldehyde | ≤ 20 | mg/kg | UV-Vis (VdL-RL 03) steam dest., AcAc, UV |

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: Coloured Products – Pigment pastes

In addition to uncoloured products, factory-coloured products or pigment pastes are also available for the processor to pigment the uncoloured product themselves. In order to ensure the validity of the natureplus Eco-label for the complete product pallet, the manufacturer must supply the following information.

1. The manufacturer shall compile a list of all system-related products (coloured products, pigment pastes etc.)
2. In the case of factory-coloured products in which compounds have been added to the base product, a declaration of the percentage of these compounds contained in the end-product must be provided.
3. Input components contained in the pigment pastes that constitute a proportion > 5 % must be declared together with the percentages of the input components in the paste. In addition, the highest recommended application quantity of the paste must be stated.
4. The pigments are declared by means of the respective CAS-number. If a distinct C.I.- number exists, this may also be used in the evaluation.

The manufacturer's information will be evaluated and analysed according to the following criteria.

A.) The pigment pastes must not contain any substances that are restricted according to GL 5001.

B.) All additives which are not used to incorporate the pigment into the base paint are prohibited. This applies in particular to the addition of artificial binders (Acrylates).

C.) The proportion of solvents contained in the paste is restricted to a value that does not exceed a value of 5 % of the highest application quantity in the pigment.

D.) Any mineral pigments which constitute a proportion of $\geq 10\%$ of the end-product will be tested for heavy metals in accordance with section 3.2. The pigments are grouped on the basis of the core metal. As a rule, this will usually be iron, copper or chromium. A mixed sample from the group is satisfactory for the analysis. If more than 5 colours are present in a mixed sample, it will be divided into a multiple of mixed samples.

E.) If pigments are employed which contain chromium, pigment samples must be taken during the factory on-site inspection. These pigments will be individually tested for the leaching of chromates. The threshold limit for the pigment must not be exceeded.

| Test parameter | Limit Value | Unit | Method |
|---------------------|-------------|-------|-------------------|
| Chromium VI (Cr VI) | ≤ 2 | mg/kg | TM-29-Chromium VI |