



natureplus e.V.

## **Guideline 1006**

### **Clay Boards**

Version: 22-05, Sept. 23, 2022

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 economic sustainability. 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 clay boards.

Clay boards, as defined in this guideline, are factory produced pre-fabricated thin boards from claybuilding materials. This includes lightweight clay boards (i.e. with a raw density under 1200 kg/m<sup>3</sup>). They are used as cladding for solid building components or in dry wall construction and subsequently rendered/plastered. The use of strengthening materials is permitted in order to increase the tensile stability and reduce damage during transportation of the products. (Lehmbau Regeln 2002/Clay Building Regulations 2002).

The following clay boards are outside the scope of this guideline:

- Clay boards made from clay-rendered bearer-boards. The individual layers of these boards are subject to testing according to the relevant individual guidelines.
- Clay boards/slabs/blocks with a thickness of 50 mm or more which are used to construct walls which do not require a sub-construction. These clay boards are covered in guideline RLI 101 "Clay Bricks".
- Clay boards/slabs/blocks with a thickness of 50 mm or more which require a sub- or auxiliary construction. These clay boards are covered in guideline RLI 101 "Clay Bricks".

## 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

Proof of the following requirements must be supplied by an accredited testing institute:

- Apparent density: The clay boards must be cut to size for a suitable test sample. The rounded mean value from three tests will be regarded as the standard value. Individual values may not deviate from this mean value by more than 10%.
- Dimensional tolerance (maximum deviation from the nominal dimensions according to EN 13168): Thickness: max. +3/-2 mm, Length: max. +5/ -10 mm, Width: ±3 mm, Angle: ≤6 mm/m, Levelness: ≤6 mm
- The flexural tensile strength at a defined sub-construction grid measurement according to DIN EN 310 in N/mm<sup>2</sup>
- Swelling and shrinkage characteristics: The manufacturer must provide detailed processing/handling instructions and describe in an appropriate manner how cracks in the render/plaster at joints and abutments may be avoided.

### 2.2 Composition, Forbidden Substances, Substance Restrictions

The product must be made to 99 M-% from mineral and renewable raw materials based upon its state of moisture balance. Any binding agents must be made predominantly from clay or loam. Products may contain a maximum of 10 M-% synthetically modified natural materials (e.g. waxes, cellulose and starch derivatives).

In particular, the following materials may not be used in the clay mortar:

- Biocides
- halogen-organic compounds
- synthetic materials and fibres (i.e. Acrylate, Polyvinyl acetate) with the exception of waxes and chemically modified natural materials e.g. methyl-cellulose.

Any hydrophobic agents employed must not contain organic solvents or softeners.

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 Raw Material Sourcing, Production of Preliminary Products, Production

A certificate of origin must be provided for all raw materials. If mineral raw materials are used, the requirements of GL-5003 must be complied with. Evidence of compliance needs to be provided.

Clay boards are produced from unformed clay building materials. The normal processes include extrusion press, single press, brush-on process or conveyor belt production. Local on-site manufactured products are outside the scope of this guideline.

If secondary raw materials are used, the product may if required, be tested for material specific parameters.

If methyl-cellulose is used as an additive, the following requirement must be complied with:

- The production of the methyl-cellulose must not negatively impact upon the environment through waste water. Proof of compliance must be provided in the form of an independent expert assessment report in accordance with BGBl. II Nr. 272/2003 (Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management – Regulations relating to organic chemicals) Appendix 2 or a comparable standard.

The manufacturer must demonstrate that a hazardous substance management according to national standards and regulations is available at the production facility for employee protection. Information on dust release and compliance with general dust limit values must be included therein. Where compliance with the general dust limit values or other occupational limit values cannot be guaranteed despite technical and organisational measures, personal protection equipment must be available. It must be aimed for a minimisation of avoidable burdens of the employees.

## 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.

## 2.5 Recycling/Disposal

Proof must be provided that the products are suitable for recycling or disposal in an inert materials disposal site/facility.

## 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 employing components with a potential for environmental hazard, the manufacturer has to suitably indicate measures to be taken to ensure environmental protection during removal and demolition (i.e. controlled deconstruction).

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

- As a Building Materials Description, the following terms should be used: - "Clay Boards" or "Lightweight Clay Boards" or alternatively the abbreviated description "CB". Clay Boards which contain binding agents other than clay or loam are to be described as "Stabilised Clay Boards".
- Consumption data
- Storage capabilities and storage requirements
- Apparent density in kg/m<sup>3</sup>
- Thermal conductivity in W/mK
- The water vapour diffusion resistance number
- Specific heat storage capacity
- The flexural tensile strength at the prescribed sub-construction grid measurement in N/mm<sup>2</sup>
- Dimensional tolerance

## 2.8 Processing and Installation

The manufacturer must demonstrate whether working procedures avoiding dust release are available for the processing of the product. If this is the case, these procedures are to be recommended and suitably presented within the processing guidelines. If compliance with the general dust limit values might not be guaranteed, wearing personal protection equipment must be recommended.

## 2.9 Packaging

The packaging used must be recyclable. The manufacturer must participate in a recycling system if there is one for the corresponding material.

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

Plastic packaging must be comprised from polyolefins. PET, polystyrene or polycarbonates are allowed exceptionally in reasonable cases. Packaging made from PVC is generally not permitted.

Packaging must not contain biocides.

The natureplus certification mark has to be printed on the packaging after the awardance of the product.

### 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)	≤ 20
Cadmium (Cd)	≤ 1
Cobalt (Co)	≤ 20
Chromium (Cr)	≤ 200
Mercury (Hg)	≤ 0,5
Nickel (Ni)	≤ 100
Lead (Pb)	≤ 20

### 3.3 Other Analyses

#### Halogenic organic compounds

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

#### Odour

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

#### Pesticides

Test parameters	Limit values	Unit	Method
Total pesticides	≤ 1	mg/kg	TM-05 Pesticides
Individual pesticides			
Organochlorine pesticides: Aldrin, Chlordane, DDD, DDE, DDT, Dichlofluanid, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Lindane, Pentachlorophenol	≤ 0,1	mg/kg	TM-05 Pesticides
Organophosphate pesticides: Dimethoat, Fenthion, Parathion-methyl, Parathion-ethyl, Phosalon			
Pyrethroids: Cypermethrin, Lambda-Cyhalothrin, Permethrin			
Other: Benomyl, Carbendazim, Prochloraz			

## 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

TM-10 PAH: HPLC / GC-MS, sum according to EPA

