

natureplus e.V.

Award Guideline 1006

Clay Boards

Issued: June 2015

For the Awardance of the Eco-Label





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1. 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 clay building materials. This includes lightweight clay boards (i.e. with a raw density under 1200 kg/m^3). 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 RL1101 "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 RL1101 "Clay Bricks".

2. Award Criteria

The prerequisite for the awardance of the natureplus eco-label is the fulfilment of the basic criteria GL-0000, of the chemicals directive GL-5001 and of the guideline for facility inspections GL-5004.

2.1 Suitability of Application

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



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- The flexural tensile strength at a defined sub-construction grid measurement according to DIN EN 310 in N/mm²
- 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.



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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

The manufacturing of all products of this product group must be in compliance with the ecological parameters listed below.

Ecological parameters per m ³	Guide values ¹
Primary energy input of non renewable total resources (PENRE ²) [MJ]	2000
Primary energy input of non renewable and renewable total resources (PET ³) [MJ]	3500
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,1
Acidification potential (AP) [kg SO ₂ -equiv.]	1
Eutrophication potential (EP) [kg PO ₄ ³⁻ -equiv.]	0,3
Global-warming potential (GWP) [kg CO ₂ equiv.]	450
Abiotic depletion potential (ADP) [kg Sb equiv.]	0,00015



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If a single guide value is exceeded, it will be decided on a case by case basis whether this is permissible for the purpose of optimising the complete product manufacturing process.

¹Testing method: Calculation of the ecological parameters according to natureplus® implementing provisions for life cycle assessments; inventory analysis analogous to ISO 14040ff; efficiency categories according to CML-IA version 4.1 from October 2012 and characterised as baseline; primary energy requirement according to Frischknecht 1996; global-warming potential 1994/100 years; system limits: raw material sourcing to products ready for shipment

² PENRE: **p**rimary **e**nergy input of **n**on renewable **e**nergy resources

³ PET: **p**rimary **e**nergy inputs of renewable and non renewable **t**otal resources

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.



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- 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^3
- 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^2
- 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 site inspection. If the sample collection can not 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 VOC - TVOC

The product is subject to a test-chamber examination to survey the emissions of VOC, SVOC and other volatile compounds and to check compliance with the limit values. Measurements usually occur after 3 and 28 days. When low VOC emissions are to be expected, the emissions test can be terminated early, if a measurement 7 days after loading of the test chamber does not object to this. The test-chamber examination is performed according to the current version of the test method TM-01 VOC.

Emission measurement after 3 days

Test parameters	Limits	Unit
VOC (VOC, VVOC, SVOC) classified in: Regulations (EC) No. 1272/2008: categories Carc. 1A und 1B, Muta 1A und 1B, Repr. 1A und 1B; TRGS 905: K1, K2, M1, M2, R1, R2; IARC groups 1 u. 2A; DFG MAK-list III1, III2	< 1	$\mu\text{g}/\text{m}^3$
Total volatile organic compounds (TVOC)	≤ 3000	$\mu\text{g}/\text{m}^3$

Emission measurement after 28 days

Test parameters	Limits	Unit
Total volatile organic compounds (TVOC)	≤ 300	$\mu\text{g}/\text{m}^3$
of which:		
Total bicyclic terpenes	≤ 200	$\mu\text{g}/\text{m}^3$
Total sensitising substances per MAK IV, BgVV-list cat. A, TRGS 907	≤ 100	$\mu\text{g}/\text{m}^3$
Total VOC (VOC, VVOC, SVOC) classified in:	≤ 50	$\mu\text{g}/\text{m}^3$

Regulation (EC) No. 1272/2008: Categorie Carc. 2, Muta 2, Repr. 2; TRGS 905: K3, M3, R3; IARC: group 2B; DFG MAK-list: III3		
Total aldehyde, C4-C11, acyclic, aliphatic	≤ 100	µg/m ³
Styrene	≤ 10	µg/m ³
Methylisothiazolinone (MIT)	< 1	µg/m ³
Benzaldehyde	≤ 20	µg/m ³
Total (VOC) without non-identified compounds	≤ 100	µg/m ³

A calculation of the r-value is performed. The limit value is ≤ 1.

Other emission measurements after 28 days

Test parameters	Limit values	Unit
Total semi-volatile organic compounds (TSVOC)	≤ 100	µg/m ³
Formaldehyde	≤ 24 ⁽¹⁾	µg/m ³
Acetaldehyde	≤ 24 ⁽¹⁾	µg/m ³

⁽¹⁾ 24 µg/m³ ≈ 0,02 ppm

Termination criteria: The emissions test can be terminated 7 days after loading the test chamber, if the values measured at this time are lower than 50% of the 28-day threshold limits.

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	Unit
Arsenic (As)	20	mg/kg
Cadmium (Cd)	1	mg/kg
Cobalt (Co)	20	mg/kg
Chromium (Cr)	200	mg/kg
Mercury (Hg)	0,5	mg/kg
Nickel (Ni)	100	mg/kg
Lead (Pb)	20	mg/kg

3.3 Other Analyses

Test parameters	Limit values	Unit	Method
Halogenic organic compounds: AOX/EOX	≤ 1	mg/kg	TM-03 Halo
Odour	≤ 3	Odour intensity	TM-04 Odour
Total pesticides	≤ 1	mg/kg	TM-05 Pesticides
Individual pesticides Organochlorine pesticides: Aldrin, Chlordane, DDD, DDE, DDT, Dichlofluanid, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Lindane, Pentachlorophenol Organophosphate pesticides: Dimethoat, Fenthion, Parathion-methyl, Parathion-ethyl, Phosalon Pyrethroids: Cypermethrin, Lambda-Cyhalothrin, Permethrin Other: Benomyl, Carbendazim, Prochloraz	≤ 0,5	mg/kg	TM-05 Pesticides
Radioactivity			
Artificial radioactivity Cs-137	not measurable		
Natural radioactivity: total avalue according to ÖNORM S 5200	≤ 0,75	Bq/kg	

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".



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

TM-05 Pesticides: DFG S 19 supplemented with the natureplus implementation rules.