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natureplus e.V.

Award Guideline RL1006

CLAY BOARDS

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For the awardance of the Eco-Label

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0. Introduction

The natureplus-award guidelines (GL) are hierarchically organised. Every product that is tested according to the product-GL must also fulfill the Basic Criteria requirements (RL0000) as well as those of the applicable product group-GL (See also § 2). In order to avoid double entries, these requirements are, as a rule, not included in the product-GL a second time.

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

A pre-requirement for the awardance of the natureplus eco-label is the fulfilment of the Basic Criteria RL 0000 and the Product Group-Award Guideline RL 01000 “Dry Wall Construction Boards”.

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%.

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- 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/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. 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

The total levels of absorbable organic halogen compounds (AOX) and metals/metalloids will be tested according to the criteria laid down in section 3. If necessary, a test-chamber analysis should be undertaken in accordance with section 3.

2.3 Raw Material Sourcing, Production of Preliminary Products, Production

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 manufacturing processes employed for all products within this group must ensure that the following ecological parameters are met:

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Ecological properties per m^3 of the finished product		
Indicator	**Limits**	**Testing Method**
Primary energy, Non-renewable[MJ/m^3]	4000	Life-cycle inventory analysis analogue ISO 14040ff
Primary energy, total, including renewable energy [MJ/m^3]	9000	
Global warming potential [kg CO2 equiv./ m^3]	450	Efficiency category according to CML 2001 Primary energy requirement according to Frischknecht 1996
Photo smog [kg Ethylene- equiv./ m^3]	0.1	
Acidification [kg SO_2 -equiv./ m^3]	1.0	Global warming potential 1994/100 years
Ozone destruction potential [kg CFC-11 equiv./ m^3]	5 E-05	System limits: Raw material sourcing up to the delivered product.
Over-fertilisation potential [kg PO_4 equiv./ m^3]	0.2	

If just a single guideline limit is exceeded, it will be decided on a case by case basis if this is permissible in order to optimise the complete product manufacturing process.

If necessary, a pesticide measurement should be undertaken in accordance with section 3.

2.4 Declaration

The following information is to be provided with the product in a form which is suitable for the consumer and/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”.
- Processing/handling instructions and safety recommendations
- Batch numbers
- Consumption data
- Storage capabilities and storage requirements
- Apparent density in kg/m^3
- Thermal conductivity in W/mK
- The water vapour diffusion resistance number μ
- Specific heat storage capacity
- The flexural tensile strength at the prescribed sub-construction grid measurement in N/mm^2
- Dimensional tolerance

2.5 Usage

The products must not display any increased levels of radioactivity and must meet the limits laid down in section 3 (Laboratory Tests).

2.6 Recycling/Disposal

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

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3 Laboratory Tests

The following laboratory tests are applied to those products applying for the eco-label. The concentration of harmful substances contained and their emission levels must not exceed the limits listed below.

Test Parameters	Limits	Testing Method
Contents:		
Metals und Metalloids	**mg/kg**	Decomposition - Nitric Acid/Hydrofluoric Acid
Arsenic (As)	≤ 20	EN ISO 11885 or DIN 38406-E29
Cadmium (Cd)	≤ 1	EN ISO 11885 or DIN 38406-E29
Cobalt (Co)	≤ 20	EN ISO 11885 or DIN 38406-E29
Chromium (Cr) Total	≤ 200	EN ISO 11885 or DIN 38406-E29
Lead (Pb)	≤ 20	EN ISO 11885 or DIN 38406-E29
Mercury (Hg)	≤ 0.5	EN 1483
Nickel (Ni)	≤ 100	EN ISO 11885 or DIN 38406-E29
Hazardous Organic Compounds	**mg/kg**	
AOX	≤ 1	natureplus –Implementation regulation „AOX/EOX“
Pesticides(1)	**mg/kg**	Analogue to DFG S 19(German Research Foundation test method 19)
Organochloride pesticides: Adrin, Chlordane, Chlorothalonil, DDD, DDE, DDT, Dichofluanid, Dieldrin, Endosulfan, Endrin, alpha-HCH, beta-HCH, delta-HCH, Heptachlor, Hexachlorobenzene, Lindane, Mirex, Pentachlorophenol	≤ 0.5 *	* Limits for individual substances Measurement threshold: 0.1 mg/kg
Pyrethroids: Cyfluthrin, Cyhalothrin, Cypermethrin, Deltamethrin, Fenvalerate, Permethrin	≤ 0.5 *	
Relevant product-specific pesticides – to be determined on a case by case basis	≤ 0.5 *	
Total of Pesticides	≤ 1	
Radioactivity		Measurement of the activity in Bq/kg of the radioactive nuclides C-40 und Cs-137 as well as the Th-sequence, U-sequence and the Ac-sequence using gamma-spectroscopy Measurement threshold: 0.5 Bq/Kg
Artificial Radioactivity: Cs -137	n.m. (2)	
Natural Radioactivity:		
Total value according to ÖNORM S 5200 (Austrian Standard S5200)	≤ 0.75	

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Test Parameters	Limits	Testing Method
Emissions: After conditioning		Chamber Process: natureplus-Implementation regulation
Volatile Organic Compounds (VOC)	**µg/m³**	DIN ISO 16000-6, DIN EN ISO 16000-9, DIN EN ISO 16000-11
VOC (VOC, VVOC, SVOC) classified in: Regulation (EG) No. 1272/2008: Categories Carc. 1A and 1B, Muta 1A and 1B, Repr. 1A and 1B; TRGS 905: K1, K2, M1, M2, R1, R2; IARC Groups 1 & 2A; DFG MAK-List III1, III2	n.d.	3 d after loading the testing chamber
Total Volatile Organic Compounds (TVOC)	≤ 3,000	3 d after loading the testing chamber
Total Volatile Organic Compounds (TVOC)	≤ 300	28 d after loading the testing chamber
Of which: Total bicyclic Terpenes	≤ 200	28 d after loading the testing chamber
Total sensitising substances per MAK IV, BgVV-List Cat. A, TRGS 907	≤ 100	28 d after loading the testing chamber
Total VOC (VOC, VVOC, SVOC) classified in: Regulation (EG) N0. 1272/2008: Categories Carc. 2, Muta 2, Repr. 2; TRGS 905: K3, M3, R3; IARC Group 2B; DFG MAK-List III3	≤ 50	28 d after loading the testing chamber
Total Aldehyde, C4-C11, acyclic, aliphatic	≤ 100	28 d after loading the testing chamber
Styrene	≤ 10	28 d after loading the testing chamber
Methylisothiazolinone (MIT)	n.d.	28 d after loading the testing chamber
Benzaldehyde	≤ 20	28 d after loading the testing chamber
Total Volatile Organic Compounds (VOC) without non-identified compounds	≤ 100	28 d after loading the testing chamber
Total Semi-Volatile Organic Compounds (TSVOC)	≤ 100	28 d after loading the testing chamber
R-Value	**Value** ≤ 1.0	28 d after loading the testing chamber
Formaldehyde	**µg/m³** ≤ 24 (3)	DIN ISO 16000-3, DIN EN 717-1 28 d after loading the testing chamber
Acetaldehyde	**µg/m³** ≤ 24 (3)	DIN ISO 16000-3 28 d after loading the testing chamber
Termination criteria: The emissions test can be terminated 7 days after the test chamber has been loaded if the values measured at this time are lower than 50% of the 28-day threshold limits.		
Odour/Smell	**Odour intensity**	VDA 270; 23°C
	≤ 3	natureplus- Implementation regulation "Odour/Smell Test", 6-stage scale, 24 hrs after loading the testing chamber

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n.m. ... not measurable;
n.d. not detectable; Threshold limit: VOC 1 µg/m³

(1) Only if required – if the use of pesticide additives is suspected

(2) Measurement Threshold 0.5Bq/kg

(3) 24 µg/m³ ≅ 0.02 ppm