

natureplus e.V.

Award Guideline 1102

Vertically Perforated Bricks

Issued: July 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 vertically perforated bricks for walls. This awardance guideline is to be applied exclusively to the named product group.

2. Award Criteria

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

2.1 Suitability of Application

The manufacturer must provide documentary evidence of compliance with EN 771-1 or a comparable standard.

The manufacturer must demonstrate how an increased level of acoustic insulation (R_w = a minimum of 43 dB), for the exterior wall constructions that they have recommended, may be achieved. If this can not be demonstrated, the manufacturer must indicate that the product is not suitable for applications in which increased acoustic insulation requirements are necessary.

Bricks and blocks which may be used for single-skin exterior walls (36.5 cm thickness and above) must exhibit a thermal conductivity (calculation value) according to EN 1745 of 0.14 W/(mK). This requirement does not apply to products which are to be used for other purposes. Also, this requirement does not apply to bricks, for which it can be proven, that they are only sold in regions in which the heating degree days in the heating period are below 2500 Kd/a.

2.2 Composition, Forbidden Substances, Substance Restrictions

At least 98% of the product based upon its state of moisture balance must be made from mineral and renewable raw materials. The following main components are permitted: Clay, loam, mineral sand/meals, water and pore-producing additives (foaming agents).

The use of any additional additive must be technically justified.

As a rule only additives from waste/recycling materials may be used as foaming agents. Proof of the origin and quality of the foaming agents must be provided. Foaming agents for masonry blocks, which are used in single-skin exterior walls, may also be produced from primary materials e.g. freshly foamed polystyrene, if the manufacturer can prove that the necessary technical



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requirements could not be met using secondary materials. A continuation of the period of this exemption ruling should be investigated at the next major test examination. The manufacturer must provide evidence of his efforts to find an alternative, which is comprised from renewable or recycled raw materials, to the polystyrene foaming agent.

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 renewable raw materials. If mineral raw materials are used, the requirements of GL-5003 must be complied with. Evidence of compliance needs to be provided.

The production facility must meet the most modern standards relating to

- the efficiency of the kiln and
- the flue gas cleaning.

Atmospheric emissions of

- dust
- sulphur dioxides, nitrous oxides, hydrogen chloride, hydrogen fluoride
- benzene, phenol, styrene, formaldehyde
- volatile organic compounds (specified as the total level of carbons)

must comply with the limitation requirements of the technical code of practice for the prevention of air pollution (TA-Luft) or a comparable standard and/or the regulations for brick production facilities (BGBl. 720/1993, see Appendix).

Periodic internal and third-party controls, the throughput levels, the height of the chimney and the location of the facility must all be sufficient to ensure that no plant damage is caused by the effects of any fluoride emissions. If there remains any suspicion of plant damage then measurements on the surrounding vegetation are to be performed. As a guideline, in this case the limits of the Austrian forestry regulations for measurements on vegetation (indicator – fir tree) should be applied:

- 0.8 % total fluoride in the first year of needle growth
- 1 % total fluoride in the second and third years of needle growth.

2.4 Usage



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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

The products must comply with the requirements for the disposal of construction waste in accordance with DepVO (Austria: BGBI 1996/164, Germany: DepV of 24.7.2002, BGBI. I S. 2807) or an equivalent standard.

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 kg	Guide values ¹
Primary energy input of non renewable total resources (PENRE ²) [MJ]	2,8
Primary energy input of non renewable and renewable total resources (PET ³) [MJ]	3,8
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,00015
Acidification potential (AP) [kg SO ₂ -equiv.]	0,001
Eutrophication potential (EP) [kg PO ₄ ³⁻ -equiv.]	0,0002
Global-warming potential (GWP) [kg CO ₂ equiv.]	0,23

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



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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.

- Details of warranty and warranty period
- Details of compatible renders and mortars

2.8 Processing and Installation

The manufacturer must recommend a natureplus-certified mortar to be used for applying the product. If such a mortar is not available, at least one low-emission mortar based on mineral



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compounds is to be recommended. This mortar must not contain more than a maximum of 5 M-% organic components and a maximum of 0.1 M-% volatile organic compounds. This is subject to testing based on the full declaration of all input materials, supplemented with information supplied by the manufacturer of the mortar. The following additives are prohibited:

- Glycol ethers and -esters
- APEO's (Alkyl phenol ethoxylate)
- Formaldehyde separators/dispersers
- Halogen organic compounds

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 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

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limit values. The analysis is performed according to the current version of the test method TM-02 metals.

Element	Limit values	Unit
Arsenic (As)	20	mg/kg
Cadmium (Cd)	1	mg/kg
Chromium (Cr)	100	mg/kg
Copper (Cu)	100	mg/kg
Mercury (Hg)	0,5	mg/kg
Molybdenum (Mo)	5	mg/kg
Nickel (Ni)	100	mg/kg
Lead (Pb)	20	mg/kg
Antimony (Sb)	5	mg/kg

In case the limit values are exceeded, an element analysis will be performed for the clay and loam raw materials. If the metal/metalloid concentrations recorded can be linked to the raw materials, an additional eluate analysis of the product will be conducted. The requirements of the elemental analysis are deemed to be met if the measurements are in compliance with the eluate limit values as listed below. If the metal/metalloid concentrations can not be attributed to the raw materials, additional research is necessary to elucidate the causes of the element contents.

Eluate analysis:

Element	Limit values	Unit
Arsenic (As)	0,05	mg/l
Cadmium (Cd)	0,004	mg/l
Chromium (Cr)	0,05	mg/l
Copper (Cu)	0,2	mg/l
Mercury (Hg)	0,001	mg/l
Molybdenum (Mo)	0,2	mg/l
Nickel (Ni)	0,04	mg/l
Lead (Pb)	0,05	mg/l
Antimony (Sb)	0,006	mg/l

3.2 Other Analyses

Test parameters	Limit values	Unit	Method
Chromium VI (Cr VI)	≤ 2	mg/kg	TRGS 613
Radioactivity			
Artificial radioactivity Cs-137	not measurable		
Natural radioactivity: total avalue according to ÖNORM S 5200	≤ 0,75	Bq/kg	

Test Methods

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

Appendix

Atmospheric emissions from the kiln must comply with the following limits:

	Parameter	Limit value	Unit
1	Dust particle emissions	50	mg/m ³

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2	Sulphur oxides (declared as SO ₂) at a mass flow rate ≥ 5 kg/h and a raw material sulphur content of:		
	a) less than 0,12%	500	mg/m ³
	b) 0,12% or more than 0,12%	500	mg/m ³
	About b): Upon request, authorities have to permit the exceedance of this limit value in an individual case, if the exceedance is technically justified by the state of the kiln technology used for brick production and by the sulphur content of the raw materials.		
3	Fluorine (declared as HF) at a mass flow rate ≥ 0.05 kg/h	5	mg/m ³
4	The expected levels of organic carbon compounds resulting from the production process (without methane) are declared as the total level of carbon at a total mass per unit volume ≥ 2 kg/h. These include:	100	mg/m ³
	a) Ethanal (Acetaldehyde) at a mass flow rate ≥ 0.1 kg/h	20	mg/m ³
	b) Benzene (independent of the mass flow rate)	5	mg/m ³
	c) Ethenyl benzene (styrene) at a mass flow rate ≥ 2 kg/h	100	mg/m ³
	d) Methanal (Formaldehyde) at a mass flow rate ≥ 0.1 kg/h	20	mg/m ³
	e) Phenol at a mass flow rate ≥ 0.1 kg/h	20	mg/m ³
	The total mass per unit volume of the substances a) to e) in the above list must not exceed 100 mg/m ³ . The sum of the mass per unit volume of Acetaldehyde, Methanal (Formaldehyde) and Phenol must not exceed 20 mg/m ³ .		
5	Nitrogen oxide (declared as NO ₂) at a mass flow rate ≥ 5 kg/h		
	a) without an afterburning system	200	mg/m ³
	b) with afterburning system	300	mg/m ³
6	Inorganic vapour or gaseous chlorine compounds (declared as HCl) at a mass flow rate ≥ 0.3 kg/h	30	mg/m ³

Source: [BGBI 1993/720 \(Austria\)](#)

The mass per unit volume and threshold limits correspond to the volume of the flue gases - which have been reduced by the volume of the steam produced during the manufacturing process - at 0 °C and 1013 mbar and with an oxygen content of 18 %. In the case of nitrous oxide emissions produced using an afterburner unit, the oxygen content level of the reduced volume of the flue gases is 15%.