

natureplus e.V.

**Guideline 0104**

# **WOOD FIBRE INSULATION BOARDS FOR CONSTRUCTION PURPOSES**

**Issue: May 2019**

**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 untreated wood fibre insulation boards according to EN 13171 for use as thermal insulation.

The awardance guideline is to be applied exclusively to those products mentioned in this guideline.

## 2. Award Criteria

The prerequisite for labelling a product with the natureplus® quality mark is compliance with the following award guidelines, where applicable:

- GL-5001 Chemicals Directive
- GL-5004 Transparency and Social Responsibility
- GL-5010 Low-emission building products

### 2.1 Functional Suitability

The manufacturer provides information about technical and physical characteristics of the product and specifies the standards, test procedures and methods used to determine these properties. If the applied standards contain requirements for the products, it is to be clearly indicated whether they are met.

The product meets the requirements for the suitability of application by holding the state-specific or the European technical approval.

The product must be in compliance with the standard EN 13171.

The thermal nominal value at 10°C and  $u_{dry}$  as per EN ISO 10456 or a comparable standard must comply with the following requirements:

- Insulation not subject to pressure load (W, WL, WV):  $\lambda_{90,90} \leq 0,045 \text{ W/mK}$
- Insulation subject to pressure load (WD):  $\lambda_{90,90} \leq 0,065 \text{ W/mK}$
- Insulation functioning as plaster base (WD-PT):  $\lambda_{90,90} \leq 0,050 \text{ W/mK}$

The fire behaviour of the product must correspond at least to building material class E according to EN 13501-1.



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In case the product is supplied to countries in which other requirements apply as the ones in the standards mentioned so far, these requirements must be met as well. The manufacturer states the countries where the product is distributed and provides official certification by approved testing institutions to confirm compliance with the requirements. The product must not, however, fall short of the requirements established by natureplus.

The product must not be treated with compounds which prevent or strongly reduce its ability for water uptake or water release.

The product must be resistant to mould growth under the conditions of a professional installation. Evidence has to be provided in form of a rating of mould fungus growth as category 0 (no growth visible with microscopic analysis) according to EN ISO 846.

## 2.2 Composition, Forbidden Substances, Substance Restrictions

At least 85% of the product based upon its dry weight must be made from renewable or mineral raw materials.

The employed wood must comply with § 2.3 with regard to the proportion of freshly cut wood and the origin of wood. At least 50 M-% should be made from secondary raw materials such as sawmill residue, chippings, slabs and offcuts from trees.

Only mineral additives such as inorganic ammonium phosphates (diammonium phosphate, ammonium polyphosphate, etc.), other water-releasing minerals (aluminum hydrate, etc.) or expanded graphite are permitted as flame retardants. The proportion of ammonium phosphates within the product may not exceed 4 kg per m<sup>3</sup>. The proportion of waterproofing agents within the product may not exceed 2% of the dry weight of the product. The use of bitumen is prohibited, as is use of boron compounds as flame retardants or as protectant against microbial infestation.

The proportion of synthetic binding agents is restricted to a maximum of 4% of the dry weight of the product.

The use of synthetic support fibres is restricted to a maximum of 15% of the dry weight of the product. Chlorinated polymers are not permitted.

The application of biozides 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.



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## 2.3 Raw Material Sourcing, Production of Preliminary Products, Production

A certificate of origin must be provided for lignocellulose based raw materials. At least 80 % of the lignocellulose shavings, chippings and fibres contained within the product must originate from a source within a radius of no further than a 300 road-kilometre-equivalent<sup>(1)</sup> from the production plant. (1) 1 km Road ≈ 2.5 km Train ≈ 27 km Ship-Overseas ≈ 4 km Ship-Inland waterways.

The requirements of the guideline GL-5002 for the origins of wood and wood production must be met for wood as a raw material.

The manufacturer has to state and to place his suppliers under the obligation that no synthetic plant protecting product with agents included on the list of banned pesticides of the chemicals directive GL-5001 are used during growing, harvest, storage or transport of lignocellulose based materials. Compounds based on arsenic or mercury must not be employed. Implementing the obligation and the supplier's declarations are a part of the certification procedures.

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.

If the boards are produced using a wet-process, the manufacturer should aim to keep the water used in the production process in a closed circulation system. If an open circulation system is employed, the following points apply: The specific amount of waste water should not exceed 2 m<sup>3</sup> per ton of wood fibre board. If the waste water is discharged into flowing water systems (i.e. rivers, canals) or into the public sewerage/drainage system, the following emission limits should be observed:

	Discharge into a flowing water system	Discharge into the public sewerage system
<b>General parameters</b>		
Temperature	30°C	35°C
Bacterial toxicity G <sub>L</sub>	4	a)
Fish toxicity G <sub>F</sub>	2	a)



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Settleable matter	0,3 ml/l	10 ml/l
pH value	6,5-8,5	6,0-9,5
<b>Anorganic parameters</b>		
Ammonium as nitrogen (N)	5,0 mg/l	-
Sulfate as SO <sub>4</sub>	-	200 mg/l
<b>Organic parameters</b>		
COD (chemical oxygen demand) as O <sub>2</sub>	1 kg/t	-
BOD5 (5 day biochemical oxygen demand) as O <sub>2</sub>	25 mg/l	-
AOX as chlorine (Cl)	0,2 g/t	0,2 g/t
Total Hydrocarbons	10 mg/l	20 mg/l
Phenol	0,3 g/t	60 g/t

a) A discharge must not detrimentally affect the biological decomposition processes within a public water treatment facility.

If the waste water is discharged into a flowing water system, the level of aluminium contained in the waste water must be below 2 mg/l.

If the waste water is discharged directly into a water treatment facility, special rules may be agreed with the water treatment authorities on a case by case basis. The guideline values may be exceeded under special conditions if circumstances permit or if it is necessary and authorised/prescribed by the responsible authorities.

The production equipment air emissions must comply with the emission levels in accordance with the air cleanliness regulations for boiler plant equipment Austria (BGBl. 1989/19 and/or 1997/324) or a comparable regulatory standard.

## 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.



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## 2.5 Recycling/Disposal

The product must be suitable for safe disposal in a waste incineration 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 FU <sup>2</sup>	Guide values <sup>1</sup>	
	Apparent density <90kg/m <sup>3</sup>	Apparent density >90kg/m <sup>3</sup>
Primary energy input of non renewable total resources (PENRE <sup>3</sup> ) [MJ]	50	140
Primary energy input of non renewable and renewable total resources (PET <sup>4</sup> ) [MJ]	90	400
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,0015	0,02
Acidification potential (AP) [kg SO <sub>2</sub> -equiv.]	0,012	0,045
3- Eutrophication potential (EP) [kg PO <sub>4</sub> -equiv.]	0,007	0,018
Global-warming potential (GWP) [kg CO <sub>2</sub> equiv.]	3	8
Abiotic depletion potential (ADP) [kg Sb equiv.]	0,00003	0,00005

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.

**1** **Testing method:** Calculation of the ecological parameters according to natureplus® implementing provisions for life cycle assessments; inventory analysis analogous to ISO 14040ff;



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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

- <sup>2</sup> **FU:** Functional Unit, corresponds to a thermal resistance of 1 m<sup>2</sup>K/W.
- <sup>3</sup> **PENRE:** primary energy input of non renewable total resources
- <sup>4</sup> **PET:** primary energy inputs of renewable and non renewable total 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

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
- A full declaration of the country of origin of the main components

If components are employed which are potentially environmentally damaging, the manufacturer must, in an appropriate place, provide information on the environmental protection measures to be taken 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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- Labelling according to the guidelines of the European Community (Communauté Européenne, CE marking) or the respective general technical approval, including a scope specification
- Apparent density in  $\text{kg/m}^3$
- Thermal nominal value  $\lambda_D$  according to EN ISO 10456 or an equivalent standard
- Thermal design value  $\lambda_R$  according to EN ISO 10456 or an equivalent standard
- Type and field of application, i.e. as per DIN 4108, Austrian standard ÖNORM B 6000
- Euro class according to EN 13501-1

## 2.8 Processing

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 manufactured from polyolefins. In cases when sufficient grounds can be presented, the use of PET, polystyrene or polycarbonates may be permitted. Packaging made from PVC is generally not permitted.

Packaging must not contain biocides.

Upon award of a natureplus certification, the natureplus logo must be printed/displayed on the packaging.

## 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 collec-





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tion 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 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	Unit
Arsenic (As)	2	mg/kg
Cadmium (Cd)	0,5	mg/kg
Cobalt (Co)	5	mg/kg
Chromium (Cr)	10	mg/kg
Copper (Cu)	50	mg/kg
Mercury (Hg)	0,2	mg/kg
Nickel (Ni)	10	mg/kg
Lead (Pb)	5	mg/kg
Antimony (Sb) <sup>(1)</sup>	2	mg/kg
Tin (Sn)	10	mg/kg
Thallium (Tl)	1	mg/kg
Zinc (Zn)	500	mg/kg

<sup>(1)</sup> As antimony acts as a catalyst in polyester production, the limit value for antimony does not apply for products containing supporting fibres on polyester basis.

### 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
<b>Individual pesticides</b>  <b>Organochlorine pesticides:</b> Aldrin, Chlordane, DDD, DDE, DDT, Dichlofluanid, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Lindane, Pentachlorophenol  <b>Organophosphate pesticides:</b> Dimethoat, Fenthion, Parathion- methyl, Parathion-ethyl, Phosalon  <b>Pyrethroids:</b> Cypermethrin, Lambda-Cyhalothrin, Permethrin <b>Other:</b> Benomyl, Carbendazim, Prochloraz	≤ 0,1	mg/kg	TM-05 Pesticides

Test parameter	Limit values	Method
Foreign substances/fibres	NAD	TM-08 Foreign fibres

### 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

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

TM-08 Foreign fibres and substances: Scanning electron microscopy SEM