natureplus e.V.

Award Guideline 1005

Cement-Bonded Woodchip/Particle Boards

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For the Awardance of the Eco-Label

1. Application Areas

The following criteria contain the requirements for the awardance of the natureplus eco-label for cement-bonded woodchip/particle boards with untreated surfaces as per EN 633 or with a general Building Inspectorate approval which are used for general, load-bearing and reinforcement purposes in dry or damp environments. Cement-bonded woodchip/particle boards, as defined in this guideline, are factory produced wood-based boards/slabs which are manufactured by compressing small wood particles or other vegetable-based particles together with Portland cement or magnesia cement and possibly other additives.

Cement-bonded woodchip/particle boards for use as façade cladding are regulated in Award Guideline RL0213. Particle boards employing organic binding agents, particle boards using gypsum as a binding agent as well as bonded composite materials and factory laminated boards are outside the scope of this guideline.

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

The manufacturer must provide documentary evidence of compliance with EN 634-1 including the additional requirements of EN 13986. If Portland cement is used as a binding agent the manufacturer must prove compliance with EN 634-2. These requirements also apply to particle boards utilising other cement binding agents. The cement employed must comply with the requirements of EN 197 or a comparable standard.

The strength and rigidity of cement-bonded woodchip/particle boards used for load-bearing applications must comply with the requirements of EN 789 and if used as sub-flooring or roof cladding, the impact resistance must comply with EN 1195 and/or EN 12871.

If the product is to be used for sound-proofing applications, then proof of the sound-proofing characteristics based upon EN 13986 must be provided in the form of independent expert assessments.

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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. In particular, the following materials may not be used in cement-bonded woodchip/particle boards: Biocides and halogen-organic compounds.
Mineralisation agents (mineral salts) are permitted additives. Additional additives are to be restricted to a technically possible minimum. Any hydrophobic agents employed must not contain organic solvents or softeners. Only mineral pigments are permitted in the colouration/dyeing of the cement-bonded woodchip/particle boards.

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 primary raw materials. The requirements of the guideline GL-5002 for the origins of wood and wood production must be met for wood as a raw material. If mineral raw materials are used, the requirements of GL-5003 must be complied with. Evidence of compliance needs to be provided.

The wood shavings/chips/particles employed should contain a high proportion of secondary raw materials such as old wood, timber obtained from the pruning/thinning and maintenance of forests or industrial waste wood i.e. sawn off-cuts, chippings, bark and off-cuts from trees.
If old-wood is employed, the requirements for old wood as laid down in GL-5002 have to be met.

If the product uses a proportion of more that 5% cement as a binding agent, then the cement manufacturer must provide confirmation that the following requirements have been met:

- The cement production equipment must meet modern standards for energy efficiency of the ovens and for the flue gas cleaning equipment.
- If waste products are also incinerated, then the emissions must comply with the guideline 2000/76/EC of 4th December 2000 concerning the incineration of waste - Point II.1 “Special Regulations for Cement Ovens in which Waste Products are Incinerated”

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

Evidence is to be provided that the product can be recycled or that the components are suitable for disposal in a landfill for inert waste.

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 m³	Guide values[1]
Primary energy input of non renewable total resources (PENRE[2]) [MJ]	6000
Primary energy input of non renewable and renewable total resources (PET[3]) [MJ]	8000
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,1
Acidification potential (AP) [kg SO_2-equiv.]	1,5
Eutrophication potential (EP) [kg PO_4^{3-}-equiv.]	0,3
Global-warming potential (GWP) [kg CO_2 equiv.]	550

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; 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 **r**enewable **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.

- Designation in accordance with the guidelines of the European Community (Communauté Européene, CE-designation) or the relevant Building Inspectorate approval including details of the scope of the approval.
- General data (designation, type, name, etc.)
- Areas of application in accordance with EN 13986
- Weight per surface area in kg/m² or weight per volume [kg/m³]
- Origin of the wood
- Fire resistance classification in accordance with DIN EN 13501 Part 1

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2.8 Processing and Installation

If it is necessary to employ an adhesive during the handling/installation process, the manufacturer must recommend a natureplus certified product or a very low emission adhesive, where possible a mineral-based adhesive, in accordance with EMICODE EC1 or a comparable standard (e.g. “Blauer Engel“ – the Blue Angel environmental quality label). The recommended adhesive must not contain any of the following additives:

- Glycol ethers and esters
- APEO's (alkylphenol ethoxylates)
- Halogenated Isothiazolinone
- Formaldehyde decomposition agents

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 be 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	**µg/m³**
Total volatile organic compounds (TVOC)	≤ 3000	**µg/m³**

Emission measurement after 28 days

Test parameters	Limits	Unit
Total volatile organic compounds (TVOC)	≤ 300	**µg/m³**
of which:		
Total bicyclic terpenes	≤ 200	**µg/m³**
Total sensitising substances per MAK IV, BgVV-list cat. A, TRGS 907	≤ 100	**µg/m³**
Total VOC (VOC, VVOC, SVOC) classified in: Regulation (EC) No. 1272/2008: Categorie Carc. 2, Muta 2, Repr. 2; TRGS 905: K3, M3, R3; IARC: group 2B; DFG MAK-list: III3	≤ 50	**µg/m³**
Total aldehyde, C4-C11, acyclic, aliphatic	≤ 100	**µg/m³**
Styrene	≤ 10	**µg/m³**
Methylisothiazolinone (MIT)	< 1	**µg/m³**
Benzaldehyde	≤ 20	**µg/m³**
Total (VOC) without non-identified compounds	≤ 100	**µg/m³**

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/m³**
Formaldehyde	≤ 24 (1)	**µg/m³**
Acetaldehyde	≤ 24 (1)	**µg/m³**

(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)	5	mg/kg
Cadmium (Cd)	1	mg/kg
Cobalt (Co)	20	mg/kg
Chromium (Cr)	100	mg/kg
Copper (Cu)	50	mg/kg
Mercury (Hg)	1	mg/kg
Nickel (Ni)	20	mg/kg
Lead (Pb)	20	mg/kg
Antimony (Sb)	5	mg/kg
Tin (Sn)	10	mg/kg
Thallium (Tl)	1	mg/kg
Zinc (Zn)	300	mg/kg

3.3 Other Analyses

Test parameters	Limit values	Unit	Method
Chromium VI (Cr VI)	≤ 2	**mg/kg**	TRGS 613
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".

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.

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