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natureplus e.V.

Award Guideline RL1001

GYPSUM-BONDED FIBRE 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 gypsum-bonded fibre boards. The award guideline is to be applied exclusively to those products mentioned in this guideline. External thermal insulation composite systems employing gypsum-bonded fibre boards or adhesive-bonded boards are outside the scope of this guideline.

2 Award Criteria

A pre-requirement for the awardance of the natureplus eco-label is the fulfilment of the Basic Criteria RL0000 and the Product Group-Award Guideline RL1000 “Dry Wall Construction Boards”.

2.1 Suitability of Application

Please note: The following functional suitability requirements remain valid until the introduction of a European Standard for gypsum-bonded fibre boards.

The dimensions (length, width, thickness, diagonal etc) must comply with the tolerance requirements of comparable products (e.g. gypsum/plaster boards).

The apparent density of the boards must lie in the range 1.0 – 1.4 g/cm^3

The flexural strength of the boards must be ≥ 5.5 N/mm^2. Boards with a thickness of 18mm or greater must exhibit a flexural strength of ≥ 5.0 N/mm^2

The boards must be classified as non-flammable.

After the absorption of moisture and subsequent drying, the boards should not exhibit any loss of strength or stability.

If the product is to be used in timber-framed constructions for structural related purposes (strengthening/stiffening of ceilings, roofs or walls), its suitability must be confirmed by relevant technical building approvals.

Compliance with the aforementioned requirements should be ensured by means of self-monitoring and third-party control based upon EN 520 [(1)] or a comparable standard and should be verified by a state authorised test institute.

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For the following constructions, measurement results of the sound reduction index value R'w (according to DIN 4109 or a comparable standard) and the fire rating classification (according to DIN 4102 or a comparable standard) must be provided:

- Stud partition wall with a profiled, sheet-steel frame, coated on both sides with a single layer of the product applying for certification (board thickness 12.5mm) and containing a 40mm layer of insulation material.
- Stud partition wall with a profiled, sheet-steel frame, coated on both sides with a double layer of the product applying for certification (board thickness 12.5mm) and containing a 40mm layer of insulation material.

(1) EN 520, Gypsum/plaster boards - Definition, requirements and test procedures

2.2 Composition, Forbidden Substances, Substance Restrictions

The following component substances are permitted: gypsum, cellulose fibres from recovered paper and water.

The use of hydrophobic (water resistant/repellent) substances within the product is permitted if required. The use of further additives must be technically justified.

2.3 Raw Material Sourcing, Production of Preliminary Products, Production

A certificate of origin must be provided for all raw materials.

Evidence must be provided that the gypsum employed within the products is of a pure quality. If flue gas desulphurisation (FGD)-gypsum is used, the manufacturer may demonstrate this through specifications to the supplier relating to the use of high quality fuels, appropriate combustion techniques, filter sequences and regular intake controls.

By the use of cellulose fibres from recovered paper, the manufacturer must ensure through intake controls that paper contaminated with heavy metals is not employed.

The production equipment must comply with modern standards relating to

- the energy efficiency of the dryer and the press
- the water consumption and the water circulation management (recycling)

Atmospheric emissions, especially dust, must comply with the limits of TA-Luft (German technical code of practice for atmospheric emissions) or a comparable regulatory standard.

Production waste and swarf must be re-employed in the production process or utilised by another means.

The manufacturing processes employed for all products within this group must ensure that the following ecological parameters per kg of the product supplied are met:

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Test Parameters	Limits	Testing Method
Acidification [kg SO_2 -equiv./ m^3]	2,4	Life-cycle inventory analysis analogue ISO 14040ff Efficiency category according to CML 2001
Photo smog [kg Ethylene- equiv./ m^3]	0,1	System limits: Raw material sourcing up to the delivered product.
Global warming potential [kg CO2 equiv./ m^3]	450	Global warming potential 1994/100 years
Non-renewable energy sources [MJ/m^3]	7000	Primary energy requirement according to Frischknecht 1996

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.

The total levels of absorbable organic halogen compounds (AOX), metals/metalloids and radioactivity will be tested according to the criteria laid down in section 3. If flue gas desulphurisation (FGD)-gypsum is used then further analyses may be performed if required.

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:

- Disposal instructions for product leftovers and packaging
- A full declaration of the ingredients listed in descending order according to the proportion contained within the product in accordance with the Basic Criteria RL0000

For the constructions specified in section 2.1, the product documentation must contain a declaration of the measurement results of the sound reduction index value R'w and the fire rating classification.

2.5 Installation

When bonding the boards or the joints with adhesive, it must be possible to use a natureplus certified adhesive or a very low emission bonding material in accordance with EMICODE EC1 or a comparable standard (e.g. "Blauer Engel" – the Blue Angel environmental quality label). The manufacturer must include a reference to at least one of these products within the product documentation.

2.6 Usage

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

2.7 Recycling/ Disposal

The board components must be suitable for recycling.

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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
Antimony (Sb)	≤ 5	AAS (atomic absorption spectroscopy) graphite tube or DIN 38406-E29
Arsenic (As)	≤ 5	AAS (atomic absorption spectroscopy) graphite tube or DIN 38406-E29
Cadmium (Cd)	≤ 1	DIN 38406-E19 or DIN 38406-E29
Chromium (Cr) Total	≤ 20	EN ISO 11885 or DIN 38406-E29
Copper (Cu)	≤ 35	EN ISO 11885 or DIN 38406-E29
Lead (Pb)	≤ 15	DIN 38406-E6 or DIN 38406-E29
Mercury (Hg)	≤ 1	EN 1483 or DIN 38406-E29
Molybdenum (Mo)	≤ 5	EN ISO 11885 or DIN 38406-E29
Nickel (Ni)	≤ 20	EN ISO 11885 or DIN 38406-E29
Selenium (Se)	≤ 10	AAS (atomic absorption spectroscopy) graphite tube or DIN 38406-E29
Thallium (Tl)	≤ 1	AAS (atomic absorption spectroscopy) graphite tube or DIN 38406-E29
Tin (Sn) Zinc (Zn)	≤ 5 ≤ 300	AAS (atomic absorption spectroscopy) graphite tube or DIN 38406-E29 EN ISO 11885 or DIN 38406-E29
Radioactivity		
Artificial Radioactivity: Cs -137 Natural Radioactivity: Total value according to ÖNORM S 5200 (Austrian Standard S5200)	n.m. [(1)] ≤ 0.75	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

n.m. ... not measurable;

[(1)] Measurement Threshold 0.5Bq/kg

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Test Parameters	Limits	Testing Method
Emissions: After conditioning		Chamber Process: natureplus- Implementation regulation
Volatile Organic Compounds (VOC) 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	**µg/m³** n.d.	DIN ISO 16000-6, DIN EN ISO 16000-9, DIN EN ISO 16000-11 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 (2)	DIN ISO 16000-3, DIN EN 717-1 28 d after loading the testing chamber
Acetaldehyde	**µg/m³** ≤ 24 (2)	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.		

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Odour/Smell	**Odour intensity**	VDA 270; 23℃
	≤ 3	natureplus- Implementation regulation "Odour/Smell Test", 6-stage scale, 24 hrs after loading the testing chamber

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

(2) 24 µg/m³ ≅ 0.02 ppm