

natureplus e.V.

Award Guideline 0404

Mineral-Based Foam Insulation Boards for Internal Use

Issued: June 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 mineral-based foam insulation boards for internal use. The awardance guideline is to be applied exclusively to those products mentioned in this guideline. Mineral-based foam insulation boards for external use are regulated in award guideline GL0405

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.

Thermal insulation composite systems employing mineral-based foam insulation boards for internal use must also comply with the requirements of award guideline GL-0301.

2.1 Suitability of Application

The manufacturer must declare the following building physics characteristic values:

- Water vapour diffusion resistance factor μ in accordance with EN 12086
- Water absorption under conditions of long-term immersion in accordance with EN 12087
- Water absorption under conditions of short-term partial immersion in accordance with EN 1609

The thermal nominal value at 23°C and 50% humidity as per the corresponding European standards must comply with the following requirements:

- Insulation not subject to pressure load $\lambda_{23,50} \leq 0,045 \text{ W/mK}$
- Insulation functioning as plaster base $\lambda_{23,50} \leq 0,055 \text{ W/mK}$
- Insulation subject to pressure load $\lambda_{23,50} \leq 0,065 \text{ W/mK}$

The manufacturer must provide proof in the form of appropriate test assessments.

The product must be classified as non-flammable (class A1 and A2-s1,d0 according to EN 13501).



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2.2 Composition, Forbidden Substances, Substance Restrictions

The following components are permitted: building lime, sand, cement, water and pore-producing additives. The proportion of hydrophobic (water resistant/repellent) and surface treatment substances within the product must not exceed 2% of the total amount of all other components. The use of further additives must be technically justified. The product must consist of at least 97% mineral-based components based upon the dry weight of the product.

Halogenic organic compounds and polyurethane 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.

2.3 Raw Material Sourcing, Production of Preliminary Products, Production

The extraction of mineral raw materials must be in compliance with the requirements as laid down in GL-5003.

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 bitumen is employed in the production of the product, the manufacturer must prove that no aerosols or dusts containing bitumen are released during the production process and occur at the work places. The total of all bitumen aerosols or fumes determined as per BIA 6305 or a comparable standard must not exceed the detection limit of 0,5 mg/m³. Evidence must be provided that the exposure to benzo[a]pyrene does not exceed 0,5 ug/m³.

If quartz sand is used as an additive, the manufacturer must provide evidence that no danger was posed to the workforce from quartz dust during the production process. Relevant evidence includes: the pneumatic insertion of the quartz sand; no permanent workplaces in areas with high dust levels; dust extraction using high-efficiency filters; controls and inspections on a rotational basis by an official/governmental safety agency/inspectorate etc.

If the product contains more than 5% cement, the cement manufacturer must provide confirmation that the following requirements have been met:



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- 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 Directive 2000/76/EC of 4. December 2000 concerning the incineration of waste - Point II.1 "Special Regulations for Cement Ovens in which Waste Products are Incinerated"

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

The components must be suitable for disposal in a landfill for inert waste according to the "Decision of the EU council of the 19th December 2002 on the definition of criteria and procedures for the receipt and acceptance of waste products at waste disposal sites according to article 16 and appendix 2 of the guideline 1999/31/EG".

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 FE ²	Guide values ¹
Primary energy input of non renewable total resources (PENRE ³) [MJ]	65
Primary energy input of non renewable and renewable total resources (PET ⁴) [MJ]	70
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,0015
Acidification potential (AP) [kg SO ₂ -equiv.]	0,015
Eutrophication potential (EP) [kg PO ₄ ³⁻ -equiv.]	0,007
Global-warming potential (GWP) [kg CO ₂ equiv.]	4,7



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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: FU Functional Unit, corresponds to a thermal resistance of 1 m²K/W.

³ PENRE: **p**rimary **e**nergy input of **n**on renewable **e**nergy resources

⁴ 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).



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Additionally, the following product-specific information must be made available to the consumer or user.

- Labelling according to the guidelines of the European Community (Communauté Européenne, CE marking) or the respective general technical approval, including a scope specification
- General data according to corresponding European standards or indications about product characteristics
- Density ρ [kg/m³]
- Indications about the product's fire behaviour

2.8 Processing/Installation

The manufacturer must provide qualified installation and handling instructions, in particular on methods to avoid thermal bridges. The documentation must also contain construction examples for a condensation-free and thermal-bridge-free installation of the components.

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 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.



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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/m ³
Total volatile organic compounds (TVOC)	≤ 3000	µg/m ³

Emission measurement after 28 days

Test parameters	Limits	Unit
Total volatile organic compounds (TVOC)	≤ 300	µg/m ³
of which:		
Total bicyclic terpenes	≤ 200	µg/m ³
Total sensitising substances per MAK IV, BgVV-list cat. A, TRGS 907	≤ 100	µg/m ³



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Total VOC (VOC, VVOC, SVOC) classified in:		
Regulation (EC) No. 1272/2008: Category Carc. 2, Muta 2, Repr. 2; TRGS 905: K3, M3, R3; IARC: group 2B; DFG MAK-list: III3	≤ 50	µg/m ³
Total aldehyde, C4-C11, acyclic, aliphatic	≤ 100	µg/m ³
Styrene	≤ 10	µg/m ³
Methylisothiazolinone (MIT)	< 1	µg/m ³
Benzaldehyde	≤ 20	µg/m ³
Total (VOC) without non-identified compounds	≤ 100	µg/m ³

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/m ³
Formaldehyde	≤ 24 ⁽¹⁾	µg/m ³
Acetaldehyde	≤ 24 ⁽¹⁾	µg/m ³

⁽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)	10	mg/kg
Cadmium (Cd)	1	mg/kg
Cobalt (Co)	20	mg/kg



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Chromium (Cr)	50	mg/kg
Copper (Cu)	35	mg/kg
Mercury (Hg)	0,5	mg/kg
Nickel (Ni)	20	mg/kg
Lead (Pb)	15	mg/kg
Antimony (Sb)	5	mg/kg
Tin (Sn)	5	mg/kg
Zinc (Zn)	150	mg/kg

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
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