



natureplus e.V.

## **Guideline 0404**

# **Mineral-Based Foam Insulation Boards for Internal Use**

Version: 22-05, Sept. 23, 2022

for the awardance of the eco-label

## 0 Introduction

The International Association for Sustainable Building and Living – natureplus e.V. – has set itself the goal, through the awardance of a quality label (eco-label), of promoting the use of those construction products which are especially suited to achieving the goal of economic sustainability. The three classic pillars of sustainability (the environment, social aspects and the economy) are reflected in natureplus's the three fundamental requirements: the environment, health and functional quality.

Every construction activity encroaches upon the natural environment and is connected with the consumption of limited resources. Our responsibility towards future generations requires us to undertake every effort to reduce these encroachments to the lowest level possible and to limit our use of resources to a necessary minimum. In view of the foreseeable exhaustion of the reserves of fossil fuels, for example, and the dangers to the earth's climate, such an approach is the only possible means to ensure sustainable and socially equitable development. For the building sector this means promoting the use and application of construction products which help to minimize the consumption of fossil fuels and limited resources. It is natureplus's intention to help promote the commercial success of those products which fulfil these demands.

Energy-saving building methods and the avoidance of uncontrolled ventilation facilitates the accumulation of volatile chemical compounds in the interior air that are emitted by building products and the inventory contained within the building. This presents a(n) (avoidable) danger to the health of the occupants. Also, the accretion of chemical contaminants (especially phthalates/plasticisers) from building products on house dust, the increasing use of biocides in everyday products and the dangers posed by mould growth due to negative product characteristics give rise for concern. An increasing proportion of the population are exhibiting reactions, such as allergies, to the negative health-related effects of these construction products. natureplus therefore evaluates the compatibility of construction products, especially in the usage phase, according to strict standards in order to actively promote those materials which pose no risk to health and are, in addition, conducive to a healthy room climate.

The natureplus®-Eco-label is an award for construction products which meet the highest standards of sustainability by exhibiting the best possible performance in terms of the environment, health and functionality. Scope of the assessment is the building material as raw material and as component. Only the best products in a particular product group are eligible for certification in order to act as an orientation for all building professionals and consumers towards the promotion of a culture of sustainable building. The natureplus®-Eco-label has anticipated the requirements of construction products of the European Construction Products Directive EU CPR 305/2011: In the future this regulation requires a declaration of performance with evidence of the sustainable use of natural resources and of compliance with requirements in terms of low impact, over their entire life cycle, on the environmental quality or on the climate, energy-efficiency and the hygiene, health and safety of people. The natureplus®-Eco-label already provides these proofs of performance in relation to the essential characteristics of construction products. This is gauged by natureplus according to criteria and requirements which, as a rule, far exceed the legal requirements and as a minimum comply in each case with the strictest recognised standards applicable.

The natureplus®-Eco-label is classified as a Type I environmental label as per ISO 14024, taking into consideration the EU Ecolabel Regulation and the EMAS regulation on environmental auditing, and is valid across the whole of Europe according to uniform criteria. The pre-requirements for a construction product to be certified with the natureplus®-Eco-label are its especially high performance characteristics in terms of the environment, health and sustainability. The main focuses are on the protection of limited resources by the minimisation of the use of petrochemical substances, sustainable raw material extraction/harvesting, resource-efficient production methods and the longevity of the products. Therefore, building products made from renewable raw materials, raw materials which are unlimited in their availability or from secondary raw materials will be favoured for certification.

## 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 a product to be awarded the natureplus® quality label in accordance with these guidelines is compliance with the following award guidelines:

- GL-5001 Chemicals Directive

The prerequisite for a product to be awarded the natureplus quality label is compliance with the basic criteria RL-0000 and the chemicals directive RL-5001.

- GL-5003 Nature Conservation when Exploiting Mineral Resources
- GL-5004 Transparency and Social Responsibility
- GL-5010 Low-emission building products
- GL-5020 Climate compatibility and energy efficiency

### 2.1 Functional Suitability

The manufacturer must declare the following building physics characteristic values:

- Water vapour diffusion resistance factor  $\mu$  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  $\lambda_{23,50} \leq 0,065 \text{ W/mK}$

All declared values, in particular the nominal values of thermal conductivity, must be tested and monitored by an accredited body.

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

### 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

When using mineral raw materials, the requirements of RL-5003 must be complied with.

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.

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

- No raw materials have been used in the production of the cement which are classified as hazardous waste according to the directory of waste regulations (Abfallverzeichnisordnung (AVV)) or originate from areas which are classified as highly contaminated.
- 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 these waste products should be of a defined quality and not adversely affect the emission balance of the incineration process. The emissions must comply with the guideline 2000/76/EG of 4. December 2000 concerning the incineration of waste - Point II.1 "Special Regulations for Cement Ovens in which Waste Products are Incinerated"

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/m<sup>3</sup>. Evidence must be provided that the exposure to benzo[a]pyrene does not exceed 0,5 ug/m<sup>3</sup>.

## 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.

Emissions must not exceed the natureplus limits according to section 3 during the use phase. (see section 3 and RL5010)

## 2.5 Recycling/Disposal

The products must be disposable in inert landfills in accordance with the "Decision of the EU Council of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC".

## 2.6 Ecological Parameters

All products in this product group must be manufactured in such a way that the ecological parameters listed in RL 5020 are fulfilled.

## 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

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  $\rho$  [kg/m<sup>3</sup>]
- Indications about the product's fire behaviour

## 2.8 Processing and 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 belong to a recycling system, if one exists for the corresponding material.

Paper and cardboard packaging must be made from recycled paper. Alternatively, paper from sources as per GL-5002 is also permitted.

Plastic packaging must be made from polyolefins. PET, polystyrene or polycarbonates are allowed exceptionally in reasonable cases.

PVC packaging is generally not permitted.

Packaging must not contain biocides.

The natureplus certification mark has to be printed on the packaging after it has been awarded.

## 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 production audit. If the sample collection 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 Volatile Organic Compounds 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 [mg/kg]
Arsenic (As)	≤ 10
Cadmium (Cd)	≤ 1
Cobalt (Co)	≤ 20
Chromium (Cr)	≤ 50
Copper (Cu)	≤ 35
Mercury (Hg)	≤ 0,5
Nickel (Ni)	≤ 20
Lead (Pb)	≤ 15
Antimon (Sb)	≤ 5
Tin (Sn)	≤ 5
Zinc (Zn)	≤ 150

### 3.3 Other Analyses

#### Halogenic organic compounds

Test parameters	Limit values	Unit	Method
Halogenic organic compounds: AOX/EOX	≤ 1	mg/kg	TM-03 Halo

#### Odour

Test parameters	Limit values	Unit	Method
Odour	≤ 3	Odour intensity	TM-04 Odour

## 4 Appendix

### 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 extended by natureplus implementing regulations

TM-08 Foreign fibres and foreign substances: scanning electron microscopy SEM

TM-09 Monomeric isocyanates: 24h after test chamber loading

TM-10 PAH: HPLC / GC-MS, sum according to EPA

