natureplus e.V.

Guideline 0406

Cellular Glass Insulation Boards

Version: Oct. 23, 2026
for the awardance of the eco-label

Introduction

The International Association for Sustainable Building and Living - natureplus association - pursues the goal of promoting sustainable building products and increasing their popularity and use. To this end, sustainability criteria for building products are defined and verified as part of regular conformity assessments at the applicant's premises.

Three comprehensive sustainability definitions are created to achieve a holistic understanding of quality.

CLIMATE PROTECTION

The climate crisis is worsening, and the consequences are becoming increasingly visible. The construction sector is one of the largest emitters, accounting for around 40% [1] of global greenhouse gas emissions. Energy-intensive manufacturing processes, long transport routes and short renovation cycles are often still characteristic of the status quo.

The natureplus certification requires manufacturers to meet limit values on CO2 emissions and primary energy consumption.

[1] UNEP, 2020, 2020 Global Status Report for Buildings and Construction, p. 4.

HEALTHY LIVING

In Western societies, we spend about 90% [2] of our lives in buildings. Pollutants emitted by building materials can accumulate in the indoor air we breathe daily, posing unnecessary health risks to occupants. The accumulation of chemical pollutants from building materials in household dust is also a cause for concern.

The natureplus certification ensures that hazardous input materials are avoided or used in quantities that are harmless to health. Emissions from building products are strictly regulated and regularly monitored.

[2] Umweltbundesamt, o. D., Ausschuss für Innenraumrichtwerte (AIR)

CONSERVATION OF RESOURCES

All construction activities have an impact on nature and the environment, with the consumption of finite resources remaining unacceptably high. The production of building materials in Germany consumes about 60% of our resources, and as much as 90% if only mineral raw materials are considered. At the same time, the construction sector is responsible for 50% of the waste generated. [3]

The natureplus certification sets out requirements for increased transparency in the supply chain, respect for human rights and the environment, and the responsible use of resources throughout the life cycle of a building product.
Sustainable materials should also be durable, reusable, or recyclable.

[3] VDI ZRE, 2019, Ressourceneffizienz im Bauwesen – Von der Planung bis zum Bauwerk, p. 5.

Notes on this product guideline:

The eco-label, the certification programme including all associated documents is the property of the non-profit natureplus® environmental organisation. The Association and its specially appointed Criteria Commission are therefore responsible for the further development of the requirements.

The label is awarded by the European cooperative natureplus Institute SCE mbH.

In the event of textual discrepancies between different language versions of a guideline, the Criteria Commission's Task Force will determine the valid wording. The affected language versions will be amended to reflect the valid wording.

In the event of conflict between the basic guidelines (50XX) and this product guideline, the product award guideline shall prevail.

For questions, criticism and suggestions, please contact:

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1 Application Areas

The following criteria contain the requirements for the awardance of the natureplus eco-label for cellular glass insulation boards. Cellular glass is also known as foam glass. The award guideline is tobe applied exclusively to those products mentioned in this guideline. Cellular glass granulate for insulation purposes is regulated in the natureplus Award Guideline GL0407 “Cellular Glass Granulate”.

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:

- GL5001 Chemicals Directive

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- GL5001 Chemicals Directive
- GL-5003 Nature Conservation when Exploiting Mineral Resources
- GL5004 Transparency and Social Responsibility
- GL5010 Low-emission building products
- GL5020 Climate compatibility and energy efficiency

2.1 Functional Suitability

The technical requirements for cellular glass are regulated in EN 13167 “Thermal insulation products for buildings - Factory made cellular glass (CG) products – Specification”.

The manufacturer must prove compliance with EN 13167 through the submission of appropriate documentation.

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 $\lambda_{23,50} \leq 0{,}045$ W/mK
- Insulation functioning as plaster base $\lambda_{23,50} \leq 0{,}055$ W/mK
- Insulation subject to pressure load $\lambda_{23,50} \leq 0{,}065$ 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 cellular glass insulation boards must only be comprised of gas-proof and waterproof glasscells, which are joined together without the use of a binding agent. Approved foaming agents are carbonic substances (e.g. magnesium carbonate, calcium carbonate or sugar - among others).

The boards may be laminated on one or both sides with bitumen coatings, glass fleeces or mineral-based coatings. Plastics (e.g. PVC) may not be used as lamination materials.

Additional input substances such as hydrophobic (water resistant/repellent) additives are not dealt with in this guideline.

Halogenic organic compounds and polyurethane are not permitted.

The product is subject to assessments as detailed in section 3 and must comply with the limits specified therein.

2.3 Raw Material Sourcing, Production of Preliminary Products, Production

When using mineral raw materials, the requirements of RL-5003 " Nature conservation in the mining of mineral raw materials" must be complied with.

A minimum of 60% of the glass employed should be the product of recycling processes (external production waste, building site waste, post-consumer waste).

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.

In production facilities outside the European Union, the applicant must demonstrate that the production facility has a hazardous substance management system for the protection of employees that meets the relevant European standards and legal regulations. This must also include information on the release of dust and compliance with the general dust limit values. Where technical or organizational measures cannot ensure compliance with general dust limit values or other workplace limit values, suitable personal protective equipment must be provided. Efforts must be made to minimize avoidable exposure of workers.

If the products are laminated, then efforts should be made to ensure a low-emission production process (the avoidance of concentrations of harmful substances in the production facility through the use of air/gas extraction equipment, the use of low emission adhesives etc.). This applies in particular to the use of bitumen laminations.

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 workplaces. 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.

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 Reuse, recycling and disposal

A recycling concept must be submitted containing details of the feasibility of the following disposalmethods according to a distinction between building site waste and demolition waste:

- Recovery of cellular glass (only for demolition waste)
- Options for the recycling of materials (re-smelting, ...)
- Options for re-use or alternative usage (as loose-fill thermal insulation, as a lightweight aggregate in concrete...)
- Instructions on environmentally-compatible landfill (e.g. separation of layers, condensing/compressing, ...)

This recycling concept should contain descriptions and evaluations, in the most concrete terms possible, relating to their technical applicability and their ecological compatibility.

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 environmental parameters listed in RL5020 are complied with.

2.7 Public Declaration

A public declaration of ingredients[1] must be provided in the official language of the country in which the product is intended for sale. It must be freely accessible. Ingredients must be listed in descending order of weight. The following publicly accessible documentation paths are permitted:

- Product packaging
- Technical data sheet
- Sales brochures
- Website

Ingredients from preliminary products or preparations that remain in the final product with a content of >1 M% must also be included in the full declaration.

The following applies to the public declaration of ingredients:

- above 1 M% the name of the ingredient
- below 1 M% at least the functional name of the ingredient, the mass order is cancelled.

[1] Ingredients are substances and mixtures that remain in the final product. Reactants and ancillary input materials are included in the non-public full declaration submitted to the assessment body

Furthermore, there is an obligation to include the following information with the product or to make it available to the consumer or user in an appropriate manner (e.g. online):

- Instructions for use and safety instructions
- Storage and disposal instructions
- Batch numbers
- Country of production
- Country of origin of input materials > 20 M-% where there is a deviation from the country of production

When using ingredients with an environmentally hazardous potential, the applicant must indicate at an appropriate place which measures are to be taken within the framework of dismantling and demolition work to protect the environment (e.g. controlled dismantling).

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 and Installation

In the installation and processing, a differentiation is made between adhesive-bonded and loose laid variants. Bonded installations of cellular glass boards are applied using either hot bitumen or cold adhesives.

Cold adhesives are used, above all, in wall and ceiling insulation installations. If, due to structural reasons, a vapour-proof installation is required (e.g. for interior insulation), the cellular glass boards are laid on mineral substrates such as concrete, bricks, lime-sand blocks etc. using a full-surface application of bitumen cold adhesive which is also applied between the board joints. For all other installation applications, it is possible to use mineral-based adhesives.

For the application of cold adhesives, at least one solvent-free adhesive must be available that fulfils the requirements of RL5001 and the declaration requirements under 2.7 of this product guideline.

The adhesive must not contain halogenated isothiazolinones.

The product is subjected to a test for halogenated isothiazolinones, polycyclic aromatic hydrocarbons and, in the case of applications relevant to indoor air, an emission test in accordance with section 3 and must comply with the limit values specified therein (point 3.4. "Test requirements for cold adhesives").

(see sections 3.1 and 3.3 "Test requirements for cold adhesives").

Hot bitumen is used, above all, for bonding purposes in (flat) roof insulation and floor insulation which is subject to increased moisture levels. For installations which do not require additional sealing measures, the surface of the cellular glass boards is protected and stabilised with a hot bitumen topcoat.

During the processing of hot bitumen, it is possible that polycyclic aromatic hydrocarbons and bitumen fumes may be emitted. In order to protect the installer/ processor, the manufacturer must take measures during the product development and by informing the workers through appropriate product information of the risks of exposure to bitumen fumes, in order that this exposure is reduced to a minimum. It should be stated that hot bitumen should only be used in an environment in which a continuous fresh-air exchange can be guaranteed.

A natureplus-certification covering the use of hot bitumen in interior areas is only intended for rooms which are subject to high moisture levels (wet-rooms, industrial kitchens, swimming pools etc.) and does not apply to the use of hot bitumen in residential or office rooms.

In the case of loose-laid installations, large-format, fleece-coated cellular glass boards are laid upon a bed of sand or stone chips. This form of installation is used above all in exterior and interior floor insulation applications which are not subject to high moisture levels.

The manufacturer should inform the user in an appropriate form that the loose-laying method should be preferred, where this is technically possible, and that hot bitumen should only be used in external installations or where a high resistance to moisture (e.g. wet-rooms) is required.

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 GL5002 is also permitted.

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

Packaging must not contain biocides.

Once awarded, the natureplus label together with the license number must be printed on the packaging or made visible to the consumer in another suitable place.

3 LaboratoryTests

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.

Separate requirements apply to the cold adhesive used.

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. 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.

Test requirements for cold adhesives

A separate test chamber measurement shall be performed for the cold adhesive used. The above requirements apply.

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.

An eluate analysis is mandatory if the required values of the content analysis are not met.

Element	Limit value [mg/kg]
Arsenic (As)	≤ 40
Cadmium (Cd)	≤ 1
Cobalt (Co)	≤ 20
Chromium (Cr)	≤ 50
Copper (Cu)	≤ 35
Mercury (Hg)	≤ 0,5
Nickel (Ni)	≤ 20
Lead (Pb)	≤ 150
Antimon (Sb)	≤ 20
Tin (Sn)	≤ 150
Zinc (Zn)	≤ 250

If the specified limit values are exceeded, the product is additionally subjected to an eluate analysis. If the eluate limit values are met, the test for metals/metalloids is considered successfully completed. If the detected metal/metalloid concentrations of the product are not due to the raw material, the test for metals/metalloids is considered as not successfully completed.

Element	Limit Value [mg/l]
Arsenic (As)	≤ 0,05
Cadmium (Cd)	≤ 0,004
Cobalt (Co)	≤ 0,2
Chromium (Cr)	≤ 0,05
Copper (Cu)	≤ 0,2
Mercury (Hg)	≤ 0,001
Nickel (Ni)	≤ 0,04
Lead (Pb)	≤ 0,05
Antimon (Sb)	≤ 0,006
Tin (Sn)	≤ 0,05

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

Polycyclic aromatic hydrocarbons (PAH)

For cellular class insulation boards laminated with bitumen. The limit value applies for pure bitumen. If the bitumen is mixed with other (e.g. mineral) components, the limit value drops in accordance with the mixing ratio.

Test parameters	Limit values	Unit	Method
Polycyclic aromatic hydrocarbons	≤ 50	mg/kg	HPLC/GC-MS

Test requirements for cold adhesives

Test parameters	Limit values	Unit	Method
Halogenic organic compounds: AOX/ EOX	≤ 1	mg/kg	TM-03 Halo
Odour	≤ 3	Odour intensity	TM-04 Odour
Halogenated isothiazolinones	≤ 0,5	mg/kg	LC-MS
Polycyclic aromatic hydrocarbons	≤ 10	mg/kg	HPLC/GC-MS

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 in guideline 5010.

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 3 days after loading the test chamber following VDA 270:2018.

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