

natureplus e.V.

Guideline 0111 (draft)

Blow-in insulating materials from straw (discontinued)

Version: Oct. 5, 2026

for the awardance of the eco-label

draft

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 strict limits 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

This guideline was suspended on 1 July 2026 by a resolution of the Criteria Commission and the Executive Board.

Products certified in accordance with these requirements remain valid until the end of the licence period and must continue to comply with the requirements of this guideline.

The product group described here will in future be covered by [Guideline 0107 "Blown-in Insulation Materials"](#).

The following award criteria contain requirements for awarding the natureplus® eco-label to blow-in insulating materials made of straw. The award criteria is to be applied exclusively to the mentioned product group.

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
- GL5002 Origin of Wood and Wood Production
- GL5004 Transparency and Social Responsibility
- GL5010 Low-emission building products
- GL5020 Climate compatibility and energy efficiency

2.1 Functional Suitability

The product must fulfil the requirements for functional suitability by having a national or European technical approval or by following a harmonised standard.

The applicant shall meet this requirement by submitting one of the following documents:

- a valid European Technical Assessment (ETA)
- a declaration of performance and conformity according to a European harmonised technical specification (e.g. standard)
- a valid national technical approval (e.g. in Germany a general technical approval – abZ, in Austria a technical approval – BTZ)
- a national declaration of performance and conformity to a national technical specification (e.g. standard)

Compliance with the usability requirements associated with this approval must be ensured by internal or external monitoring and the relevant evidence, e.g. monitoring/quality assurance protocols and test reports for factory production control, certificate of conformity from the notified monitoring body, must be submitted. The verification must take the following test parameters into account, whereby the specified requirements for the building physics characteristics apply:

- Nominal value of thermal conductivity according to EN 12667 or equivalent standard: $\lambda_{10, \text{dry}, 90/90} \leq 0.045 \text{ W/m K}$
- Building material class according to EN 13501-1 at least E
- Bulk density $\rho \geq 90 \text{ kg/m}^3$ 115 kg/m^3
- Settling behaviour under vibration (SV) and under vibration (SD) or under cyclical temperature and humidity loading (Scyc) in accordance with EN 15101-1 or equivalent standard¹
- Fiber dimensions: Fiber width max. 5 mm, fiber length max. 30 mm
- Moisture content according to EN ISO 12571 $u_m \leq 15\%$
- humidity conversion factor
- Resistance to micro-organisms according to EN 15101-1 or equivalent standard¹

In case the product is supplied to countries in which other requirements apply as the ones in the standards mentioned so far, these requirements must be met as well. The applicant states the countries where the product is distributed and provides official certification by approved testing institutions to confirm compliance with the requirements. The product must not, however, fall short of the requirements established by natureplus.

2.2 Composition, Forbidden Substances, Substance Restrictions

At least 95 % by mass of the product must consist of renewable raw materials. Excluded from this are products with increased fire protection properties. These must consist of at least 85 wt. % renewable raw materials.

The following substance bans and restrictions apply in addition to those listed in the natureplus® Chemicals Directive GL-5001:

- No organohalogen compounds may be added
- No synthetic-organic flame retardants may be added. Products classified in building material class D or higher according to EN 13501-1 or equivalent may contain up to 15 % by mass of mineral flame retardants.
- The use of boron compounds is not permitted.
- The use of biocides is not permitted. Mineral raw materials with a biocidal effect which meet the requirements of the Chemicals Directive GL-5001 are excluded from this. The ecological and human-toxicological harmlessness and the additional technical benefit of these components must be proven. The definition of "biocide" corresponds to the definition in Regulation (EU) No. 528/2012 on the placing on the market and use of biocidal products.

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

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

The manufacturing company undertakes to obtain declarations of conformity from its raw material suppliers that no synthetic pesticides are used in the cultivation of the vegetable fibres.

If possible, internationally recognised labels should be used as evidence. Compliance with the criterion is additionally checked by laboratory tests. For this purpose, the product to be awarded is comprehensively screened for pesticide residues on the basis of L 00.00-115/1. This method allows the detection of approx. 500 pesticides in biogenic products. If a pesticide is detected, it is assessed in individual cases whether the result can be tolerated or whether measures are necessary to avoid it. This assessment is based on the toxicological classification of the pesticide, analogies to

the pesticides already evaluated and the suspected source of contamination. For products in which pesticide residues have been detected, more frequent control measurements may be established, even if the limit values in Section 3 have not been reached.

The manufacturer shall ensure, through delivery specifications, incoming raw material controls and product quality controls, that

- the amount of weeds and residual grain in the straw is as low as possible
- the straw has no active mould infestation
- the moisture content of the straw is low ($\leq 15\%$)
- the straw is transported dry and stored protected from the weather and rising soil moisture until it is ready for processing
- for factory processing:
 - the bulk density is not less than 90 kg/m^3 and not more than 115 kg/m^3 .
 - the maximum fibre width is 5 mm and the maximum fibre length is 30 mm
 - the product is installed dry and settling-proof.

When installed, the product quality is significantly influenced by the moisture properties of the selected overall construction. In this context, the planning and processing requirements in Section 2.8 Processing apply.

Compliance with the criteria for "transparency and social sustainability" throughout the entire supply chain is to be achieved in accordance with natureplus® Certification Criteria GL-5004. In addition to the proofs mentioned in GL-5004, awards with demeter or Naturland are suitable.

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.

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

The manufacturer must submit a dismantling concept with the aim of high-quality reuse of the product and provide proof of existing recycling processes, e.g. suction.

The product must be suitable for safe disposal in a waste incineration facility.

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).

In addition, the following product-specific information must be made available to the consumer or user:

- Marking in accordance with the building authority approval and, if not included therein,
- Product characteristics according to section 2.1

2.8 Processing and Installation

The product may be processed at the factory or on site.

The manufacturer must provide detailed processing guidelines and technical product information, including design examples, in particular for the flow-free and condensate-free design of components. The manufacturer must provide proof of the moisture-technical suitability of the design.

The applicant must demonstrate whether low-dust working methods are available for processing the product. If this is the case, these procedures are to be recommended and suitably presented within the processing guidelines. Compliance with the general dust limit value must be ensured by low-dust working methods. If this is not possible, the wearing of personal protective equipment must be prescribed.

This information must also be appropriately displayed on the packaging (pictograms and text). Delivery may only be made to suitably trained processors. The product may only be used by trained users within the company where it is to be used and in compliance with occupational health and safety conditions.

The manufacturer must provide the processor with sufficient information on how the product is to be introduced in a settlement-safe manner.

The manufacturer must oblige the processor to use a method by which the results of each processing operation can be checked.

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. 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-O2 metals.

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

Element	Limit value [mg/kg]
Arsenic (As)	≤ 2
Cadmium (Cd)	$\leq 0,5$
Cobalt (Co)	≤ 5
Chrome(Cr)	≤ 10
Copper (Cu)	≤ 50
Mercury (Hg)	$\leq 0,2$
Nickel (Ni)	≤ 10
Lead (Pb)	≤ 5
Antimon (Sb)	≤ 2
Tin (Sn)	≤ 10
Thallium (Tl)	≤ 1
Zinc (Zn)	≤ 500

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

Flame retardants

Test parameters	Limit values	Unit	Method
Flame retardants (organophosphates) –single TMP, TEP, TPP, TiBP, TBP, TPhP, TKP, TEHP, TBEP, TCEP, TCPP, TDPP	≤ 1	mg/ kg	

Pesticides

Test parameters	Limit values	Unit	Method
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	$\leq 0,5$	mg/ kg	TM-05 Pesticides

4 Appendix

Test methods

TM-01 VOC : Volatile Organic Compounds VOC/TVOC, formaldehyde, acetaldehyde and TSVO: 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

natureplus® Certification Criteria GL-5001 Chemicals Directive

natureplus® Certification Criteria GL-5004 Transparency and Social Responsibility

natureplus® Certification Criteria GL-5010 Low-emission building products

natureplus® Certification Criteria GL-5020 Climate compatibility and energy efficiency

European Assessment Document EAD 040138-01-12-01 In-situ formed loose fill thermal and/or acoustic insulation products made of insulation products made of vegetable fibres

EN 12667 Thermal performance of building materials and building products – Determination of thermal resistance by the plate and heat flow measuring plate method – Products with high and medium thermal resistance

EN 13501-1 Classification of construction products and construction types with respect to their reaction to fire – Part 1: Classification with results from reaction to fire tests of construction products

EN 15101-1 Thermal insulation products for buildings – In-situ produced cellulosic (LFCI) thermal insulation products – Part 1: Specification for products before installation

EN ISO 12571 Thermal and moisture performance of building materials and building products – Determination of hygroscopic sorption properties

EN ISO 17294-2 Water quality – Application of inductively coupled plasma mass spectrometry (ICP-MS) – Part 2: Determination of selected elements including isotopes of uranium

EU Cosmetics Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 concerning cosmetic products

ISO 846 Plastics – Determination of exposure of plastics to micro-organisms (ISO/DIS 846:2018)

L 00.00-115/1:2018-10 Examination of foodstuffs – New version of the multi-method for the determination of pesticide residues in plant foodstuffs using GC-MS and/or LC-MS/MS after acetonitrile extraction/distribution and purification with dispersive SPE (QuEChERS) (New version of method L 00.00-115 by the Working Group on Pesticides in accordance with § 64 LFGB)

Straw Construction Guideline SBR-2014, Fachverband Strohballenbau Deutschland e.V., Verden, 22.11.2014, available at <http://fasba.de/>

Stroh-Cert – Certification, Logistics and Quality Management for Straw Bale Construction, Reports from Energy and Environmental Research 36/2011, R. Wimmer, H. Hohensinner, S. Eikemeier, Publisher: BMVIT, available at <https://nachhaltigwirtschaften.at/de/hdz/projekte/stroh-cert-zertifizierung-logistik-und-qualitaetsmanagement-fuer-den-strohballenbau.php>

Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 on the placing on the market and use of biocidal products