natureplus e.V.

Guideline 2001

Prefabricated elements in timber constructions

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for the awardance of the eco-label

natureplus e.V., Hauptstr. 24, 69151 Neckargemünd, Germany, info@natureplus.org

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:

International Association for Sustainable Building and Living - natureplus association
Hauptstr. 24, 69151 Neckargemünd, Germany
criteria@natureplus.org
+49 (0)6223 866 017 0

1 Application Areas

The following award criteria contain requirements for awarding the natureplus® quality mark to factory-made flat construction elements such as exterior and interior wall constructions, facades, roof and ceiling constructions in timber construction (hereinafter: construction elements), which consist of a combination of various construction products (hereinafter: components) and contain all functional layers for serviceability. The criteria are to be applied exclusively to the above-mentioned construction elements. The following materials, products and systems are not considered:

- Wood hybrid construction elements
- Windows and Doors
- Finishing materials for further interior work, such as wallpaper, tiles or floor coverings
- Electrical, heating, ventilation and sanitary installationsand furniture.

The certification of the constructionelement does not entitle the user to advertise the individual components contained therein with the natureplus mark.

A building made of certified constructionelements may not be advertised with the natureplus® quality mark or as a "natureplus house".

2 Award Criteria

The prerequisite for a buiding element to be awarded the natureplus® quality label in accordance with these guidelines is compliance with the following award guidelines:

- GL-5001 Chemicals Directive
- GL5002 Origin of Wood and Wood Production
- GL-5003 Nature Conservation when Exploiting Mineral Resources
- GL5004 Transparency and Social Responsibility
- GL5010 Low-emission building products
- GL5020 Climate compatibility and energy efficiency

Requirements for the system components

All components and alternative components in the element structure must be named and declared individually in accordance with the natureplus declaration regulations in GL-5001.

Components used in the elements must be certified or be certifiable based on a natureplus award guideline. This does not apply to technical aids and auxiliary materials.

At least one of the components used in a construction element must hold a valid natureplus certificate. For elements with more than five components at least one other component must be certified.Technical aids and auxiliary materials are not counted as components. If the construction element is offered in different versions, this requirement must be proven for all versions to be certified.

2.1 Functional Suitability

The manufacturer provides information about technical and physical characteristics of the product and specifies the standards, test procedures and methods used to determine these properties. If the applied standards contain requirements for the products, it is to be clearly indicated whether they are met.

Construction elements used against outside air, soil or unheated parts of buildingsmust be suitable for use in buildings which comply with the national

standards of the Energy Performance of Buildings Directive 2010/2018 in the countries in which the elements are sold.

For the building element and all components, the prescribed structural approvals and/or declarations of conformity to the CE declaration in accordance with the EU Construction Products Directive and safety data sheets as well as other evidence of usability must be submitted. If available, the results of voluntary quality tests such as laboratory test reports or environmental product declarations (EPD) as well as other product or input material information must also be submitted.

2.2 Composition, Forbidden Substances, Substance Restrictions

The construction element must consist of 95 % by mass of renewable or mineral raw materials. Fasteners and technical aids are not included in this calculation.

The use of petrochemical substances is only permitted in their function as fasteners and technical aids.

The use of plastic sheets for moisture protectionis permitted if compliance with the Chemicals Directive RL-5001 can be demonstrated.

The use of PVC both as a component and as an ingredient, e.g. in auxiliary materials or aids, is not permitted.

Chemical wood preservatives for the preventive protection of wood and wood-based components are not permitted.

As part of the initial assessment of the building element, all components must be fully recorded using the natureplus survey form for building elements.

Components that have been awarded the natureplus® quality seal do not require any further assessment.

Components that have not been awarded a quality mark will be subject to an evaluation. The requirements of the basic guidelines 5001 as well as the prohibited and restricted substances and the analysis requirements of the respective product guidelines apply. Components for which no natureplus guidelines exist will be considered, with the approval of the criteria commission, according to the guidelines that best match the character of the product.

The evaluation may result in additional testing requirements and further expert reports.

Fasteners should be used in such a way that they do not hinder the subsequent separation of components for recycling or reuse.

2.3 Raw Material Sourcing, Production of Preliminary Products, Production

Proof of origin must be provided for all raw materials, prefabricated products and input components.

Components made of mineral raw materials must comply with the requirements of the Basic Guideline RL-5003.

Components made from the raw material wood must comply with the requirements of the Basic Guideline RL-5002.

The production of construction elements and components must comply with the requirements of the Basic Guideline RL-5004. Compliance with these requirements must be demonstrated and documented based on manufacturer's declarations.

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

Construction elements with indoor air contact (inside the vapour barrier or airtight layer incl. vapour barrier or airtight layer itself) must meet the natureplus limit values for VOC, SVOC and formaldehyde emissions into the indoor air in accordance with Section 3.1 VOC / TVOC.

It is possible to recognise existing emission certificates (e.g. eco-label, Blue Angel or comparable), which have been issued in accordance with the natureplus implementation regulations applicable in each case. If the available data are not significant with regard to categorisation of the applied natureplus guideline, further examinationswill be necessary.

As a result of the evaluation, laboratory tests may be required for individual components in accordance with the applicable natureplus guideline.

2.5 Reuse, recycling and disposal

The applicant must present a dismantling concept with the aim of high-quality reuse or recycling of the constructionelementor its components. The concept must ensure that the individual components can be separated into high-quality recyclable components again with little effort.

For the essential components/fractions resulting from the dismantling concept, proof of existing recycling processes must be provided.

Regardless of the recycling efforts and the actual recycling rates, the separated mineral fraction must be disposable at inert material landfills in accordance with Directive 2003/33/EC.

The organic fractions must be easily disposable in waste incineration plants.

None of the components must be classified as hazardous waste.

2.6 Ecological Parameters

A life cycle assessment (LCA) in accordance with EN 15804 is prepared for the manufacturing phase in the product life cycle from the extraction of the raw materials to the finished product (modules A1 to A3 of the LCA). The following impact and environmental parameters are considered:

- Carbon Footprint for Products (CFP) based on GWP fossil
- Total input of primary energy used (PEE)
- Share of renewable primary energy (PERE) in total primary energy input (PEE)

The components must be included in the LCA.

For components with valid natureplus certification, existing LCA data bases can be used.

For components without natureplus certification, the life cycle inventories of the respective manufacturing processes must be prepared and submitted by the suppliers. Life cycle inventory data from other balancing or declaration procedures, e.g. Environmental Product Declarations (EPD) or life cycle assessment projects, may

also be submitted for verification and used for the balancing procedure if they comply with the recognition procedure according to section 2.7 of the basic guidelines 5020.

If life cycle inventory data of components cannot be collected or submitted during the initial assessment, the results for the LCA are first approximated with indicative values.

The approximation with standard values is only possible as long as

- product-specific data are provided for at least half of the components in a building element.
- the component does not exceed a share of 10 % in one of the above-mentioned impact categories.

2.7 Public Declaration

An inventory must be made available to the customer. The inventory list may also be part of other product information such as the technical leaflet and must contain the following information:

For all components:

- Full declaration of the input materials of the components (in the national language or in English) analogous to the EU Cosmetics Regulation after decreasing mass fraction to indicate
- Input substances from precursors or preparations which remain in the product with a mass content of > 0.1 % must also be considered in the full declaration.
- If ingredients with environmentally hazardous potential are contained, information on which environmental protection measures are to be taken during dismantling or demolition work (e.g. controlled dismantling)

For the construction element

- Instructions for use and safety precautions
- Indications for storage and disposal
- Batch numbers
- City/town and country of production
- Technical instructions for dismantling in accordance with Section 2.5

2.8 Processing and Installation

No further requirements in this section.

2.9 Packaging

No further requirements in this section.

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.

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

Element analyses can be requested by the test lead for individual components as required. The provision of the product guideline that most appropriately represents the component shall apply.

3.3 Other Analyses

Other analyses may be requested by the test lead for individual components as required. The provision of the product guideline that most appropriately represents the component shall apply.

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

Glossary

natureplus declaration regulations

The construction elements and their components with the respective input materials are to be captured using the natureplus declaration form for construction elements. All input substances must be declared with the designation of the substance and with their input quantity. See guideline 5001 for further details.

National energetic standards according to the Energy Performance of Buildings Directive

In Germany, for example, the EU Buildings Directive is implemented by the Energy Saving Ordinance (EnEV). The EnEV sets minimum thermal protection requirements for construction elements such as exterior walls, roofs, etc. Manufacturers should have

appropriate evidence (such as test reports / proof of thermal insulation of the construction element).

Evaluation

In the context of this natureplus guideline evaluation means that conformity with the natureplus guideline applicable to the product is assessed based on the manufacturer's information (components, assemblies and preliminary products) and the documents submitted by the manufacturer (e.g. product and safety data sheets, building inspection approval, etc.).

This includes the initial assessment of the environmental compatibility over the life cycle, the sustainability of the resource extraction as well as the hazardousness of the ingredients and potential emissions into the indoor air.

The evaluation identifies and assesses components within the construction element that have an impact on the ecological balance sheet and are problematic for health. The result of the evaluation is a plan of measures for the follow-up audit.

For the evaluation, the following documents must be available to the auditor

- natureplus survey form for construction elements and their components and alternative components
- natureplus certificates for tested components
- Proof of functional suitability and product data sheets/technical data sheets for construction elements and components
- Safety data sheets of input materials
- Manufacturer's confirmation of compliance with the guidelines RL5002, RL5003, 5004
- If available, reports on laboratory analysis of the components

Based on this information, the assessor can assess whether

- or which information/evidence is missing
- the construction element and the components (presumably) comply with RL5001.
- there are enough life cycle inventory data for the LCA or whether an estimate with reference values is possible
- laboratory analysis is required

Based on the results, the assessor can

- create a plan of measures for the following assessment steps
- issue a recommendation on the certifiability of the construction element

Moisture protection

Plastic sheets for moisture protection in connection with this natureplus guideline include vapour barriers, sarking membranes, sealing membranes and other foils which protect the construction element against moisture penetration, i.e. against driving rain, drift snow, condensation and soil moisture.

Component

Building product which is part of a building element, e.g. insulation or building slabs within an exter-nal wall. Component layer within a construction.

Reference values

If no product-related data is available, reference values are used. These are

- natureplus reference values of the appropriate natureplus guidelines,
- Data from construction product databases (e.g. ecoinvent, baubook, etc.),
- or LCA life cycle assessment studies based on generic data from ecoinvent

If there is no guideline yet for the component, the natureplus Criteria Commission is mandated to determine ecological parameters.

Life Cycle Inventory

Recording of all essential material and energy flows for the production of the components.

Technical adjuvants/aids

Mechanical fasteners such as nails, screws, dowels, etc., other technical auxiliary materials made of plastic or metal such as plaster rails or nail plates.