



natureplus e.V.

Guideline 2001

Prefabricated elements in timber constructions

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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.

I 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 installations and furniture.

The certification of the construction element does not entitle the user to advertise the individual components contained therein with the natureplus mark. A building made of certified construction elements may not be advertised with the natureplus® quality mark or as a "natureplus house".

2 Award Criteria

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

- GL-5001 Chemicals Directive
- GL-5002 Origin of Wood and Wood Production
- 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

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 buildings must 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 all elements, 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 protection is 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.

Within the scope of the initial inspection, all components must be recorded completely using the natureplus data collection form for construction elements. Components that have been awarded the natureplus® quality mark do not require further testing. Components that have not been awarded the natureplus® quality mark are subject to evaluation. The requirements of the Chemicals Directive RL-5001 as well as the substance prohibitions, substance restrictions and analysis regulations of the applicable natureplus guideline apply.

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.

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.

2.4 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 examinations will 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 Recycling/Disposal

The manufacturer of the construction elements must present a dismantling concept with the aim of high-quality reuse or recycling of the construction element or 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 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 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

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.

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

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 external 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.

