natureplus e.V.

# Guideline 1105 (non-public)

# Porous Concrete Blocks and Elements

Version: 22-05, March 25, 2025
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 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 products in house dust and the increasing use of biocides in everyday products are 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.
In addition, future-oriented materials should be durable, reusable and/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.

**Should there be any textual differences between this guideline and the English language version, the English version shall apply.**

**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 porous concrete blocks and elements for walls. This awardance guideline is to be applied exclusively to the named 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
- GL-5003 Nature Conservation when Exploiting Mineral Resources
- GL5004 Transparency and Social Responsibility
- GL5020 Climate compatibility and energy efficiency

## 2.1 Functional Suitability

The manufacturer must, through the submission of relevant documentation, prove conformity with EN 771-4, including the increased requirements of DIN V 4165-100.

Standardised building block elements require a special proof of the applicability of the product e.g. in the form of a building inspectorate general certificate of approval.

Proof of conformity with DIN 4166 or an equivalent standard for non load-bearing standardised building blocks must be supplied.

A design value of the thermal conductivity - the thermal conductivity including a moisture content supplement – for porous concrete which is used for single-skinned external walls must be demonstrated. This must not exceed the numerical value in accordance with EN 1745, Table A 10 for λ10 tr (P = 90%).

The manufacturer must demonstrate how an increased level of acoustic insulation (Rw = a minimum of 43 dB), for the exterior wall constructions that are recommended, may be achieved.

If this can not be demonstrated, the manufacturer must indicate that the product is not suitable for applications in which increased acoustic insulation requirements are necessary.

## 2.2 Composition, Forbidden Substances, Substance Restrictions

The following components are permitted: building lime, sand, cement, recycling material from porous concrete waste (chunks/breakage), water, recycled gypsum or recycled anhydrite and pore-producing additives (foaming agents). The use of further additives must be technically justified.

Any aluminium used in the foaming agents must be from a recycled source.

The product must consist of at least 95% mineral-based components based upon the dry weight ofthe product.

The production facility must be designed in such a manner that it is capable of utilising unmixed recycling material (from building site waste, demolition) according to its availability.

The proportion of hydrophobic (water resistant/repellent) additives and other polymeradditives within the product must not exceed 5 M%.

The use and addition of biozides is not permitted.

The use of halogen-organic compounds is prohibited.

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.

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

The production facility must meet the most modern standards relating to

- the efficiency of the steam production equipment and
- the concentration of emissions

Atmospheric emissions from the steam production equipment must comply with the following limits:

| | **Parameter** | **Limit value** | **Unit** |
|---|---|---|---|
| 1 | Dust particle emissions through combustion using natural gas | 5 | mg/ m³ |
| | Soot number according to DIN 51 402 through combustion using heatingoil | 1 | |
| 2 | Sulphur oxides | | |
| | a) (declared as SO2) through combustion using natural gas | 35 | mg/ m³ |
| | b) Sulphur content of the heating oil through combustion using heating oil | 0,2 | % |
| 3 | Carbon monoxide through combustion using | | |
| | a) Natural gas | 100 | mg/ m³ |
| | b) Heating oil | 170 | mg/ m³ |
| 4 | Nitrogen oxide (declared as NOx) through combustion using | | |
| | a) Natural gas | 200 | mg/ m³ |
| | b) Heating oil | 250 | mg/ m³ |

The declared concentrations within the emitted gas should be determined under standard reference conditions (273 K, 1013 hPa), dry and with an O2 volume concentration of 3 Vol.-%.

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.

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 are 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”

## 2.4 Usage

No further requirements in this section.

## 2.5 Reuse, recycling and 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 GL5020 are fulfilled.

## 2.7 Public Declaration

A public declaration of ingredients [1] (in the national language or in English) must be provided according to decreasing mass content. The public declaration of ingredients must be mentioned in one of the following publicly available documents:

- Product packaging
- Technical data sheet
- Sales brochures
- Other publicly available document

Furthermore, after succesful certification, it is mandatory to add the public declaration of ingredients to the product data set on the natureplus database.

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: substances and mixtures that remain in the final product. Reactants and processing aids are part of the full declaration but do not need to be publicly declared.

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 [1] of the main input material [2]

[1] Designation of countries or more specific regions

[2] Key input material: The input material with the highest proportion in the product

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.

- Details of warranty and warranty period
- Details of compatible renders and mortars

If the porous concrete is advertised as possessing increased storage capacity characteristics which serve to improve the quality of the room climate, then the specific heat capacity of the porous concrete must demonstrate a level of at least 1.50 kJ/(kg•K).

## 2.8 Processing and Installation

The manufacturer must recommend a natureplus-certified mortar to be used for applying the product.

If such a mortar is not available, at least one low-emission mortar based on mineral compounds is to be recommended. This mortar must not contain more than a maximum of 5 M% organic components and a maximum of 0.1 M% volatile organic compounds. This is subject to testing based on the full declaration of all input materials, supplemented with information supplied by the manufacturer of the mortar.

The following additives are prohibited:

- Glycol ethers and -esters
- APEO's (Alkyl phenol ethoxylate)
- Formaldehyde separators/dispersers
- Halogen organic compounds

Thin-bed mortars containing cement must comply with EU-Guideline 2003/53/EC.

## 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.

PVC packaging is generally not permitted.

Packaging must not contain biocides.

Once awarded, the natureplus label 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.

## 3.1 Volatile Organic Compounds VOC / TVOC

No further requirements in this section.

## 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) | ≤ 10 |
| Chromium (Cr) | ≤ 50 |
| Copper (Cu) | ≤ 35 |
| Mercury (Hg) | ≤ 0,3 |
| Nickel (Ni) | ≤ 20 |
| Lead (Pb) | ≤ 15 |
| Antimon (Sb) | ≤ 5 |
| Tin (Sn) | ≤ 5 |
| Zinc (Zn) | ≤ 120 |

In case the limit values are exceeded, an element analysis will be performed for the sand and cement raw materials. If the metal/metalloid concentrations recorded can be linked to the raw materials, an additional eluate analysis of the product will be conducted. The requirements of the elemental analysis are deemed to be met if the measurements are in compliance with the eluate limit values as listed below. If the

metal/metalloid concentrations can not be attributed to the raw materials, additional research is necessary to elucidate the causes of the element contents.

| Element | Limit value [mg/l] |
|---|---|
| Arsenic (As) | ≤ 0,05 |
| Cadmium (Cd) | ≤ 0,005 |
| Copper (Cu) | ≤ 0,1 |
| Mercury (Hg) | ≤ 0,001 |
| Nickel (Ni) | ≤ 0,2 |
| Lead (Pb) | ≤ 0,04 |

### 3.3 Other Analyses

**Chromium VI**

| **Test parameters** | **Limit values** | **Unit** | **Method** |
|---|---|---|---|
| Chromium VI (Cr VI) | ≤ 0,5 | mg/kg | TRGS 613 |

# 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 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