

natureplus e.V.

Award Guideline 0502

Concrete Roof Tiles

Issued: July 2015

For the Awardance of the Eco-Label





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1. Application Areas

The following criteria contain the requirements for the awardance of the natureplus eco-label for concrete roofing tiles. This awardance guideline is to be applied exclusively to the named products.

2. Award Criteria

The prerequisite for the awardance of the natureplus eco-label is the fulfilment of the basic criteria GL-0000 and the chemicals directive GL-5001.

2.1 Functional Suitability

The manufacturer must provide documentary evidence of compliance with the requirements of EN 490 - Concrete roofing tiles and fittings for roof covering and wall cladding - Product specifications, and EN 491 - Concrete roofing tiles and fittings for roof covering and wall cladding - Test methods.

The manufacturer must provide details on the durability/lifespan of coated roof tiles and on the durability/lifespan of the coating. These details must be supported through the provision of appropriate expert assessment reports or other relevant proof.

If the product exhibits special, manufacturer-specific characteristics (e.g. lifespan, pollutant degradation properties, etc), these are to be supported by the provision of appropriate documentation and expert assessment reports.

2.2 Composition, Forbidden Substances, Substance Restrictions

The following components are permitted:

- Mineral-based binding agents such as cement, fly-ash, pulverised limestone,
- Aggregates such as sand, gravel and
- Water

Recycled materials should also be used as aggregates e.g. crushed concrete.

Mineral-based coatings or pure acrylate-based synthetic coatings are permitted as surface coatings, if it can be proven that the coating exhibits a sufficient durability/lifespan.



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This proof will be considered to have been provided if, for example, the manufacturer offers a 10 year guarantee on the product or can provide relevant results from long-term studies.

Only pigments from iron oxide or inorganic substances with a comparable or lower level of toxicity are permitted. Under no circumstances are metal compound additives permitted which are prohibited according to GL-5001.

The use of synthetically produced so-called nano materials which can detach themselves from the product matrix is not permitted as long as a conclusive evaluation of the health risks and the toxicological risks to the environment of these materials has not been completed and compliance shown with the requirements of the natureplus Basic Criteria. The manufacturer is responsible for providing such proof.

The use of any additional additive must be technically justified. The use of halogen-organic compounds is not permitted. Any separating agents used in the production of the roof tiles must fulfil the requirements of the natureplus Basic Criteria.

The product is subject to laboratory analyses as laid down in section 3 and has to comply with the limit values stated therein.

2.3 Raw Material Sourcing, Production of Preliminary Products, Production

Proof of the origin and quality of the raw materials must be provided. In particular, it must be ensured that the secondary raw materials are of a consistent quality level.

Through the application of quality assurance procedures in the processing plant and the roof tile works, it should be ensured that no harmful or toxic substances are introduced into the product. In particular, the materials must be free from impurities (proportion of impurities less than 1 M%). The product must not contain any tar or asbestos components. Hazardous wastes according to the German Directory of Waste Regulations (Abfallverzeichnisordnung (AVV)) as aggregates are not permitted.

If cement is employed as a binding agent, the cement manufacturer must provide confirmation that the following requirements have been met:

- The cement production equipment must meet modern standards of energy efficiency for the ovens and for the flue gas cleaning equipment.
- If waste products are also incinerated, 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"



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Proof must be provided of compliance with statutory regulations relating to the extraction of the raw materials for the binding agent(s). Documentation on the energy consumption levels and emission analyses must be provided in order that they can be confirmed.

The roof tiles must exhibit an above average ecological performance, in the areas of the conservation of natural resources and energy efficiency in both the extraction of resources and the production process, in order to be eligible for the awardance of the natureplus®-eco Label. A product eligible for certification must exhibit a distinct, above-average performance in at least one of these areas and must not fall below the level of accepted comparative standards in the other areas. The manufacturer must provide suitable proof of compliance with these criteria. For products which are not normally sold in markets beyond national borders, the comparative standards shall be deemed to be the normal industry standards of the domestic country; otherwise the standards of the target country shall apply. Included in these areas are:

Sustainable use of raw materials and resource-efficient production

- The use of suitable secondary raw materials e.g. production and building-site waste, binding agents that include a recycled proportion (e.g. super-sulphated cement), recycled aggregates, etc.
- The use of especially environmentally- and health compatible, mineral-based, coating materials or a reduction of the coating quantity if synthetic-based coating materials are employed or refraining completely from the use of a coating.
- Weight reduction e.g. through the use of lightweight aggregates
- Overfulfilment of the ecological indicator requirements, in particular with respect to a proven, especially long durability/lifespan

Sustainable usage

- A proven, especially long durability/lifespan e.g. through the use of a special coating technology
- Excellent functional suitability e.g. high levels of frost resistance, high resistance to the development of algae and moss, etc.

Recycling and reuse

- The recovery of roof tile production waste and its reuse within the production process or an alternative form of reuse
- A system for recycling building-site waste and/or the reuse of the products

The product manufacturing process for all products within this product group must comply with the following ecological indicators. In calculating the ecological indicators, the mass per unit area of the roof tiles at a roof slope of 22-24 ° has been used.



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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.

2.5 Recycling/Disposal

A disposal concept must be provided for the products.

2.6 Ecological Parameters

The manufacturing of all products of this product group must be in compliance with the ecological parameters listed below.

Ecological parameters per kg	Guide values ¹
Primary energy input of non renewable total resources (PENRE ²) [MJ]	2,5
Primary energy input of non renewable and renewable total resources (PET ³) [MJ]	3
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,00015
Acidification potential (AP) [kg SO ₂ -equiv.]	0,0008
Eutrophication potential (EP) [kg PO ₄ ³⁻ -equiv.]	0,0003
Global-warming potential (GWP) [kg CO ₂ equiv.]	0,3
Abiotic depletion potential (ADP) [kg Sb equiv.]	0,000001

If a single guide value is exceeded, it will be decided on a case by case basis whether this is permissible for the purpose of optimising the complete product manufacturing process.

¹Testing method: Calculation of the ecological parameters according to natureplus® implementing provisions for life cycle assessments; inventory analysis analogous to ISO 14040ff; efficiency categories according to CML-IA version 4.1 from October 2012 and characterised as baseline; primary energy requirement according to Frischknecht 1996; global-warming potential 1994/100 years; system limits: raw material sourcing to products ready for shipment

² PENRE: **p**rimary **e**nergy input of **n**on renewable **e**nergy resources

³ PET: **p**rimary **e**nergy inputs of renewable and non renewable **t**otal resources

2.7 Declaration

The product packaging should display a full declaration of the input materials listed, analogue to the EU-Cosmetic Regulations, according to the declining mass percentage. If it is not possible to display this information directly on the product packing, it should be provided with the product in a technical datasheet or sales leaflet (in English or in the national language). If intermediate/preliminary products or formulations are used as input substances and the proportion present in the final product is >0.1 M-%, then all the substances used within these must also be taken into account for the declaration.

For naming the input materials as part of the declaration the following applies:

- More than 1 M-% - designation of the substance in question
- Less than 1 M-% - at least a functional designation (e.g. "moth proofing agent")

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 of the key input material

When employing components with a potential for environmental hazard, the manufacturer has to suitably indicate measures to be taken to ensure environmental protection during removal and demolition (i.e. controlled deconstruction).

Additionally, the following product-specific information must be made available to the consumer or user.

- Type and field of application
- Awardance reason as per 2.3 (field of above-average performance)
- Or otherwise, the declaration of the additional positive characteristic(s) and a reference to the corresponding expert assessment report.
- Guarantee and guarantee period

2.8 Packaging

The packaging used must be recyclable. The manufacturer must participate in a recycling system if there is one for the corresponding material.

Paper and cardboard packaging must be made from recycled paper. Alternatively, paper from sources as per GL-5002 is permitted.

Plastic packaging must be comprised from polyolefins. PET, polystyrene or polycarbonates are allowed exceptionally in reasonable cases. Packaging made from PVC is generally not permitted. Packaging must not contain biocides.

The natureplus certification mark has to be printed on the packaging after the awardance of the product.

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 site inspection. If the sample collection can not 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 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.

Element	Limit values	Unit
Arsenic (As)	5	mg/kg
Cadmium (Cd)	1	mg/kg
Cobalt (Co)	20	mg/kg
Chromium (Cr)	50	mg/kg
Copper (Cu)	35	mg/kg
Mercury (Hg)	0,5	mg/kg
Nickel (Ni)	40	mg/kg
Lead (Pb)	15	mg/kg
Antimony (Sb)	5	mg/kg
Tin (Sn)	5	mg/kg
Zinc (Zn)	300	mg/kg

If the metal limit values are exceeded, an additional analysis of the raw materials (binding agents and aggregates) is performed to establish whether the increased metal/metalloid concentration(s) within the product is/are caused by particular raw materials. If the raw materials are established as the cause of the increased concentration(s), the product will be subject to an additional eluate analysis. If the product complies with the eluate limits then compliance with the requirements of the metal/metalloid tests will be deemed to have been successful. 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.

For the eluate analysis, the following limit values apply:

Element	Limit values	Unit
Arsenic (As)	0,05	mg/l
Barium (Ba)	2	mg/l
Cadmium (Cd)	0,005	mg/l
Chromium (Cr)	1	mg/l
Copper (Cu)	0,1	mg/l
Mercury (Hg)	0,001	mg/l
Nickel (Ni)	0,2	mg/l
Lead (Pb)	0,04	mg/l

3.2 Other Analyses

Test parameters	Limit values	Unit	Method
Chromium VI (Cr VI)	≤ 2	mg/kg	TRGS 613
Radioactivity			
Artificial radioactivity Cs-137	not measurable		
Natural radioactivity: total avalue according to ÖNORM S 5200	≤ 0,75	Bq/kg	

Test Methods

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.