natureplus e.V.

Guideline 1701

Draught Exclusion and Vapour-Barrier Sheeting from Renewable Raw Materials

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for the awardance of the eco-label

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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 economicsustainability. 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 requiresus to undertake every effort to reduce these encroachments to the lowest level possible andto 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 healthyroom 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 305/20111: 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.

1 Application Areas

The following criteria contain the requirements for the awardance of the natureplus eco-label for draught exclusion and vapour barrier sheeting (building paper) from renewable raw materials for interior sealant applications (from bonded, double-layer, reinforced special

paper). This award guideline is to be applied exclusively to the named products. Paper underlay sheeting from renewable raw materials for loose-fill insulation are outside the scope of this guideline and are dealt with in product guideline GL-1702.

2 Award Criteria

- GL5002 Origin of Wood and Wood Production
- GL-5004 Transparency and Social Responsibility
- GL-5010 Low-emission building products
- GL-5020 Climate compatibility and energy efficiency

2.1 Functional Suitability

The product must provide, as a vapour barrier and draught excluder, a permanent seal for the internal insulation against interior air flows. The product must meet the requirements of DIN EN 13984 ("Sealant Sheeting").

The aging stability of the products must exceed 100 years as per DIN 6738.

The sheeting must comply with class E as per DIN EN 13501-1 and should exhibit a water vapour diffusion resistance, as per DINEN 12572, in a dry state (0%/50%at 23°C) of 2m to a maximum of 5m. The water vapour diffusion resistance should be moisture variable and should in a dry state (Dry-Cup climatic difference 0%/50%) exceed that of a moist/wet condition (reversed Wet-Cup climatic difference 50%/95%) by a factor of 2.5 (as per DINEN 12572).

Proof must be provided that the products are sufficiently protected against microbial growth or infestation.

2.2 Composition, Forbidden Substances, Substance Restrictions

The product must be made to at least 88% from renewable and/or mineral raw materials (including moisture content) based upon the raw density of the end-product. The fibre composition of the special paper must be composed to at least 50% from recycled cellulose.

The proportion of adhesives should be kept to a minimum. Polyurethane/Polyurea adhesives based upon isocyanates are not permitted.

The proportion of mineral-based fire-retardants within the product may not exceed 8% (percent by weight). The fire-retardants must be halogen-free and not exhibit any herbicide effects.

The strengthening layer of fibre-glass sheeting must not contain any organic chlorine compounds.

The product and all pre-fabricated products must not contain any wood preservatives, halogen organic compounds (e.g. Methylchloroisothiazolinone), synthetic colorants (e.g. Azo dyes), formaldehyde or agents which are capable of decomposing formaldehyde.

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 RawMaterial Sourcing, Production of Preliminary Products, Production

The product paper must be made from water-resistant cellulose, of which at least 50% is recycled cellulose which has been manufactured in a closed water system.

A certificate of origin must be provided for all the product components. The raw materials should originate from local/national sources (i.e. within the European Union) and must not be derived from questionable sources.

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 product (composite materials). The components mustbe suitable for disposal in an inert materials disposal site/facility according to the "Decision of the EU council of the 19th December 2002 on the definition of criteria and procedures for the receipt and acceptance of waste products at waste disposal sites according to article 16 and appendix 2 ofthe guideline 1999/31/EG". Alternatively the components must be suitable for disposal in a waste incineration plant (thermal utilisation).

2.6 Ecological Parameters

All products in this product group must be manufactured in such a way that the ecological parameters listed in RL 5020 are fulfilled.

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.

- General data (labelling/designation, type, name, batch number, roll number etc.)
- Aging stability (Life-cycle class according to DIN 6738)
- Mass per unit area (according to DIN EN 1849-2) in g/m² or kg/m²
- Water vapour diffusion resistance numbers (according to DIN EN 1931)
- Fire rating class (according to DIN EN 13501-1)
- The area of application
- Thickness, length and width
- sd-Value in m (according to DIN EN 12572), RD- Value in m² x h x Pa / mg
- µ-Value (according to DIN EN 1931)
- Tensile strength/breaking force longitudinal and transverse to the fibres (according to DIN EN 12311-2) both in N/5 cm

2.8 Processing and Installation

In order to ensure a professional level of processing/installation and to avoid damage after these processes, it is essential that clear and comprehensive processing and installation instructions in the relevant country-specific language are provided with the product.

The air-tight adhesion/bonding of vapour barrier sheeting in internal areas must comply with DIN 4108-7, SIA 180 or ÖNorm B8110-2 (Austrian Standard).

If adhesives or adhesive tapes are used, it must be possible to use a natureplus certified adhesive or a very-low-emission adhesive product as per GEV EMICODE EC1 or an equivalent standard (e.g. "Blauer Engel"– the Blue Angel environmental quality label). The manufacturer must recommend the use of at least one such adhesive (adhesive tape).

2.9 Packaging

The packaging used must be recyclable. The manufacturer must be 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 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. 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

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 value [mg/kg]**
Arsenic (As)	≤ 5
Cadmium (Cd)	≤ 0,5
Cobalt (Co)	≤ 100
Chromium (Cr)	≤ 2
Copper (Cu)	≤ 20
Mercury (Hg)	≤ 0,1
Nickel (Ni)	≤ 10
Lead (Pb)	≤ 5
Antimon (Sb)	≤ 5

3.3 Other Analyses

Halogenic organic compounds

Test parameters	**Limit values**	**Unit**	**Method**
Halogenic organic compounds: AOX/EOX	≤ 1	mg/kg	TM-03 Halo

Halogenated isothiazolinones

Test parameters	Limit values	Unit	Method
Halogenated isothiazolinones	≤ 0,5	mg/kg	

Free Formaldehyde

Test parameters	Limit values	Unit	Method
Free Formaldehyde	≤ 20	mg/kg	UV-Vis (VdL-RL 03) steam dest., AcAc,UV

Carcinogenic amines from azo-dyes

Analysis only for coloured or printed products.

Test parameters	Limit values	Unit	Method
Carcinogenic amines from azo-dyes	≤ 10	mg/kg	according to LFGB

Organic tin compounds

Test parameters	Limit values	Unit	Method
single values for MBT, DBT, TBT	≤ 50	µg/kg	

Odour

Test parameters	Limit values	Unit	Method
Odour	≤ 3	Odour intensity	TM-04 Odour

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	≤ 0,1	mg/kg	TM-05 Pesticides

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 na-tureplus implementation rules and a sample preparation adjusted to the issue analysed.

TM-03 Halo: Halogenic organic compounds after combustion, determined by microcoulometry ac-cording 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