natureplus e.V.

Guideline 0901 (non-public)

Dispersion Adhesives from Renewable Raw Materials

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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 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 the product group "Dispersion Adhesives from Renewable Raw Materials". This award guideline is to be applied exclusively to the named product group. Wallpaper

pastes/adhesives and paper and wood glues from renewable raw materials and mineral-based adhesives are outside the scope of this guideline.

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:

- GL-5001 Chemicals Directive
- GL-5002 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 be classified as a water soluble dispersion adhesive in accordance with DIN EN 923 (“Adhesives – Terms and Definitions“) Appendix A and be suitable for the adhesion of floor and wall coverings and/or tiles and slabs on surfaces in interior areas conforming to the applicable standards.

Products for floor coverings must meet the requirements of DIN EN 14259 (“Adhesives for Floor Coverings”) and DIN EN 18365 (“Flooring works”).

Products for floor and wall coverings must be successfully tested and meet the requirements of DIN EN 1372 (“Test method for adhesives for floor and wall coverings - Peel test”), DIN EN 1373 (“Test method for adhesives for floor and wall coverings - Shear test”) and DIN EN 1902 (“Test method for adhesives for floor and wall coverings - Shear creep test”).

Adhesives for floor and wall coverings must meet the requirements of DIN EN 1903 (“Test method for adhesives for plastic or rubber floor coverings or wall coverings - Determination of dimensionalchanges after accelerated ageing”) – dimensional change < 0.2%. The manufacturer must provide proof in the form of independent expert assessments.

Products for tiles and slabs must be successfully tested and meet the requirements of DIN EN 1324(“Adhesives for Tiles - Determination of shear adhesion strength of dispersion adhesives”) and must meet the minimum requirements (requirements class 1 = normal requirements) of DIN EN 12004 (“Adhesives for Tiles – Definitions and Specifications”). The manufacturer must provide proof in the form of independent expert assessments.

The functional suitability and resistance to aging of adhesives for use in other areas (e.g. joining adhesives) must be proven and provided in a suitable form.

2.2 Composition, Forbidden Substances, Substance Restrictions

The product must be made to 99 M-% from mineral and renewable raw materials and water.

Products may contain a maximum of 10 M-% synthetically modified natural materials (e.g. waxes, cellulose and starch derivatives).

The proportion of oxidisable fatty acids or oxidisable fatty acid esters must not exceed 1 M-%.

The proportion of organic solvents must not exceed 0.5 M-%.

Preservatives may only be employed in ready-to-use liquid products, which are already available inretail or wholesale outlets, for the purpose of preserving the can or container.

Siccatives (driers) containing cobalt are prohibited.

The product must not be classified in WGK 2 or WGK 3 (Water Hazard Classes 2 and 3) according to VwVwS (Administrative Regulation on the Classification of Substances Hazardous to Waters intoWater Hazard Classes) of the German Environmental Agency (Umwelt Bundes Amt).

Preserving agents not licensed as food additives (as per Directive 89/107/EWG or equivalent) or for cosmetics (as per Directive 2003/15/EC or equivalent), halogenic organic compounds, tin organic compounds, phtalates, APEOs, formaldehyde and formaldehyde releasing agents must notbe added to the product.

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

A certificate of origin must be provided for all renewable raw materials.

If methyl-cellulose is used as an additive, the following requirement must be complied with:

The production of the methyl-cellulose must not negatively impact upon the environment throughwaste water. Proof of compliance in accordance with the national implementation of the EU-guideline EU-GL 76/464/EWG and GL 9661/EG (IPPC) must be provided in the form of an independent expert assessment report.

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.

Emissions must not exceed the natureplus limits according to section 3 during the use phase. (see section 3 and RL5010)

The tests in section 3 are performed according to the manufacturers information relating to the quantities required per coat or application. The tests are performed on a suitable test surface.

2.5 Recycling/Disposal

A disposal concept must be provided for the product (composite materials).

The adhesive should not have a significant negative affect on the disposal characteristics of the components.

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 [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 manufacturer 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.

- General data (type, name, batch numbers, designation etc.)
- Stability, storage suitability, storage conditions
- Density
- pH-value
- The dynamic viscosity
- Suitable surfaces for application, general requirements for the surface characteristics
- Preparation of the surface and the treatments or priming required
- Application (toothed trowel, tooth dimensions)
- Average covering power / efficiency in m2
- Drying time under normal climatic conditions (20°C, 60% relative humidity)
- Loading capacity and final adhesive strength in hours
- Suitability for use with under floor heating systems according to DIN 18365
- Durability to chair castors according to DIN EN 425
- Cleaning instructions (tools, appliances, clothing)

2.8 Processing and Installation

When using primers or fillers, it must be possible to use a natureplus certified product or a very low emission product in accordance with EMICODE EC1 or a comparable standard (e.g. "Blauer Engel" – the Blue Angel environmental quality label). The manufacturer must include a reference to at least one of these products within the product documentation.

For appropriate and professional processing, detailed and comprehensible processing instructions must be provided in the respective national language along with the product.

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 GL-5002 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.

The natureplus certification mark has to be printed on the packaging after it has been awarded.

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)	≤ 10
Chromium (Cr)	≤ 2
Copper (Cu)	≤ 20
Mercury (Hg)	≤ 0,1
Nickel (Ni)	≤ 10
Lead (Pb)	≤ 5
Antimon (Sb)	≤ 1
Tin (Sn)	≤ 1

3.3 Other Analyses

Halogenic organic compounds

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

Halogenic organic compounds

Test parameters	Limit values	Unit	Method
Aromatic hydrocarbons (total)	≤ 30	mg/kg	Headspace GC/MS acc. to EN ISO17895

CMR- individual aromatics

C = carcinogenic; M = mutagenic; R = toxic for reproduction; classified according to German Prohibited Chemical Substances Regulations (GefStoffV)

Test parameters	Limit values	Unit	Method
CMR-individual aromatics	≤ 1	mg/kg	Headspace GC/MS acc. to EN ISO17895

Delta-3-Caren

Test parameters	Limit values	Unit	Method
Delta-3-Caren	≤ 20	mg/kg	Solvent extraction and GC/MS

Glykolether/-ester

Test parameters	Limit values	Unit	Method
Glykolether/-ester	≤ 20	mg/kg	Solvent extraction and GC/MS

Phtalate Este

Test parameters	Limit values	Unit	Method
Phtalate Ester	≤ 10	mg/kg	Solvent extraction and GC/MS

Monomer Acrylate

Test parameters	Limit values	Unit	Method
Monomer Acrylate	≤ 1	mg/kg	Headspace GC/MS analog EN ISO 17895

Free Formaldehyde

Test parameters	Limit values	Unit	Method
Free Formaldehyde	≤ 2	mg/kg	UV-Vis (VdL-03:2018-03-4.1) or comparable methods

Organic tin compounds

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

Asbestos fibres

If the product contains secondary materials:

Test parameters	Limit values	Unit	Method
Asbestos fibres	asbestos free per DAB[1]		SEM

1: DAB: German Register of Medicines

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

Halogenated isothiazolinones

Test parameters	Limit values	Unit	Method
Halogenated isothiazolinones	≤ 0,1	mg/kg	

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