natureplus e.V.

Award Guideline 0903

Paper and Wood Glues from Renewable Raw Materials

Issued: June 2015

For the Awardance of the Eco-Label

1. Application Areas

The following criteria contain the requirements for the awardance of the natureplus eco-label for the product group “Paper and Wood Glues from Renewable Raw Materials” (e.g. glutin and casein glues etc). This award guideline is to be applied exclusively to the named product group. Dispersion adhesives and wallpaper pastes/adhesives from renewable raw materials and mineral-based adhesives are outside the scope of this guideline.

2. Award Criteria

The prerequisite for the awardance of the natureplus eco-label is the fulfilment of the basic criteria GL-0000, of the chemicals directive GL-5001 and of the guideline for facility inspections GL-5004.

2.1 Suitability of Application

The product must be classified as “glue” in accordance with DIN EN 923 („Adhesives – Terms and Definitions“) Appendix A.

Wood glues must, in accordance with DIN EN 204 (“Classification of thermoplastic wood adhesives for non-structural applications”), be classified within the appropriate durability class D1, D2, D3 and D4 (the old classification according to DIN 68602 “Assessment of Adhesives for Joining Wood and Wood-Based Products, Durability classes, Bonding Strength" B1, B2, B3 and B4). The durability classes structure the glues according to their minimum shearing strength values and their performance characteristics under wet and moist conditions.

- *D1 (old classification B1)*: Suitable for interior use where the wood moisture is below 15%.
- *D2 (old classification B2)*: Suitable for interior use with occasional, brief periods of exposure to water or condensation. The wood moisture may not exceed 18%.
- *D3 (old classification B3)*: Suitable for interior use with regular, brief periods of exposure to water or high air vapour levels. Suitable for exterior use when not directly exposed to the elements.
- *D4 (old classification B4)*: Suitable for interior use with regular and prolonged exposure to running water or condensation. Suitable for exterior use with direct exposure to the elements when used in combination with an appropriate surface protection layer.

The bonding strength of wood glues must be tested in accordance with DIN EN 205 (“Adhesives - Wood adhesives for non-structural applications - Determination of tensile shear strength of lap joints”) and the reliability of the glues under static loading and warm conditions in accordance

with DIN EN 14292 (“Wood adhesives - Determination of static load resistance with increasing temperature”). The manufacturer must provide proof in the form of independent assessments.

2.2 Composition, Forbidden Substances, Substance Restrictions

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

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

Diisocyanates and organic tin compounds are not permitted.

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 into Water 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 not be 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 through waste 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

In a solid state, 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. 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

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]	30
Primary energy input of non renewable and renewable total resources (PET[3]) [MJ]	35
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,0008
Acidification potential (AP) [kg SO_2-equiv.]	0,02
Eutrophication potential (EP) [kg PO_4^{3-}-equiv.]	0,01
Global-warming potential (GWP) [kg CO_2 equiv.]	2
Abiotic depletion potential (ADP) [kg Sb equiv.]	0,000006

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.

[1]Testing 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 **r**enewable **e**nergy resources

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

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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 (type, name, batch numbers, designation etc.)
- Stability, storage suitability, storage conditions
- Density in kg/m³
- pH-value (in accordance with DIN ISO 976)
- The dynamic viscosity in mPa x s (in accordance with DIN EN 2555)
- Solids content in % (in accordance with DIN ISO 1625)
- Water resistance in N/mm²
- Thermal resistance in N/mm²
- Creep resistance (resistance to cold flowing under static loading)
- Minimum Film Forming Temperature (MFFT) in °C (in accordance with DIN ISO 2115)
- Usage time when open, in minutes
- Usage time when closed (pot-life)

- Suitable surfaces for application, general requirements for the surface characteristics
- Preparation of the surface and the treatments or priming required
- Quantity required in g/m²
- Contact pressure required in N/mm² (equiv. t/m²)
- Minimum contact pressure period in minutes
- Setting speed in N/mm²
- Airing time
- Cleaning instructions (tools, appliances, clothing)

2.8 Processing and Installation

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

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. 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 VOC - TVOC

The product is subject to a test-chamber examination to survey the emissions of VOC, SVOC and other volatile compounds and to check compliance with the limit values. Measurements usually occur after 3 and 28 days. When low VOC emissions are to be expected, the emissions test can be terminated early, if a measurement 7 days after loading of the test chamber does not object to this. The test-chamber examination is performed according to the current version of the test method TM-01 VOC.

Emission measurement after 3 days

Test parameters	Limits	Unit
VOC (VOC, VVOC, SVOC) classified in: Regulations (EC) No. 1272/2008: categories Carc. 1A und 1B, Muta 1A und 1B, Repr. 1A und 1B; TRGS 905: K1, K2, M1, M2, R1, R2; IARC groups 1 u. 2A; DFG MAK-list III1, III2	< 1	**µg/m³**
Total volatile organic compounds (TVOC)	≤ 3000	**µg/m³**

Emission measurement after 28 days

Test parameters	Limits	Unit
Total volatile organic compounds (TVOC)	≤ 300	**µg/m³**
of which:		
Total bicyclic terpenes	≤ 200	**µg/m³**
Total sensitising substances per MAK IV, BgVV-list cat. A, TRGS 907	≤ 100	**µg/m³**
Total VOC (VOC, VVOC, SVOC) classified in: Regulation (EC) No. 1272/2008: Categorie Carc. 2, Muta 2, Repr. 2; TRGS 905: K3, M3, R3; IARC: group 2B; DFG MAK-list: III3	≤ 50	**µg/m³**
Total aldehyde, C4-C11, acyclic, aliphatic	≤ 100	**µg/m³**
Styrene	≤ 10	**µg/m³**
Methylisothiazolinone (MIT)	< 1	**µg/m³**
Benzaldehyde	≤ 20	**µg/m³**
Total (VOC) without non-identified compounds	≤ 100	**µg/m³**

A calculation of the r-value is performed. The limit value is ≤ **1**.

Other emission measurements after 28 days

Test parameters	Limit values	Unit
Total semi-volatile organic compounds (TSVOC)	≤ 100	**µg/m³**
Formaldehyde	≤ 24 (1)	**µg/m³**
Acetaldehyde	≤ 24 (1)	**µg/m³**

(1) 24 µg/m³ ≈ 0,02 ppm

Termination criteria:

The emissions test can be terminated 7 days after loading the test chamber, if the values measured at this time are lower than 50% of the 28-day threshold limits.

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	Unit
Arsenic (As)	5	mg/kg
Cadmium (Cd)	0,5	mg/kg
Cobalt (Co)	10	mg/kg
Chromium (Cr)	2	mg/kg
Copper (Cu)	20	mg/kg
Mercury (Hg)	0,1	mg/kg
Nickel (Ni)	10	mg/kg
Lead (Pb)	5	mg/kg
Antimony (Sb)	1	mg/kg
Tin (Sn)	1	mg/kg

3.3 Other Analyses

Test parameters	Limit values	Unit	Method
Halogenic organic compounds: AOX/EOX	≤ 1	**mg/kg**	TM-03 Halo
Aromatic hydrocarbons (total)	≤ 30	**mg/kg**	Headspace GC/MS analog EN ISO 17895
CMR(1)- individual aromatics	≤ 1	**mg/kg**	Headspace GC/MS analog EN ISO 17895
Delta-3-Caren	≤ 20	**mg/kg**	Solvent extraction und GC/MS
Glykolether/-ester	≤ 20	**mg/kg**	Solvent extraction and GC/MS
Phtalate ester	≤ 10	**mg/kg**	Solvent extraction und GC/MS
Monomer acrylate	≤ 1	**mg/kg**	Headspace GC/MS analog EN ISO 17895
Free formaldehyde	≤ 20	**mg/kg**	UV-Vis (VdL-RL 03) steam dest., AcAc, UV
Organic tin compounds: single values for MBT, DBT, TBT	≤ 50	**µg/kg**	
Asbestos fibres	asbestos free according to DAB(2)		SEM
Odour	≤ 3	**Odour intensity**	TM-04 Odour
Total pesticides	≤ 1	**mg/kg**	TM-05 Pesticides
Individual pesticides Organochlorine pesticides: Aldrin, Chlordane, DDD, DDE, DDT, Dichlofluanid, Dieldrin, Endrin,	≤ 0,5	**mg/kg**	TM-05 Pesticides

Heptachlor, Hexachlorobenzene, Lindane, Pentachlorophenol Organophosphate pesticides: Dimethoat, Fenthion, Parathion-methyl, Parathion-ethyl, Phosalon Pyrethroids: Cypermethrin, Lambda-Cyhalothrin, Permethrin Other: Benomyl, Carbendazim, Prochloraz			
Halogenated isothiazolinones	≤ 0,1	**mg/kg**	

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

(2) DAB - German register of medicines

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 supplemented with the natureplus implementation rules.

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