

natureplus e.V.

Award Guideline 0605

Casein-Based Paints

Issued: June 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 casein-based paints in powder form for interior applications. Casein based paints in liquid form (water-based) are covered in the natureplus award guideline RL0601 "Plant-Based Interior Wall Paints". 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, of the chemicals directive GL-5001 and of the guideline for facility inspections GL-5004.

2.1 Functional Suitability

The product must be classified according to the requirements of DIN EN 13300 (or a comparable standard). For a transitional period the German standard DIN 53778 (or a comparable standard) may also be applied.

Its yield (covering power) and its wet abrasion resistance should be at least Class 3 as per DIN EN 13300.⁽¹⁾ The manufacturer must provide proof that the product complies with these requirements by submitting appropriate test results and expert assessments.

⁽¹⁾ If the testing regulations of DIN EN 13300 are not applicable to the product characteristics, it is possible to agree a modification of the testing method with natureplus.

2.2 Composition, Forbidden Substances, Substance Restrictions

The product must be made to at least 99% from renewable and mineral raw materials.

Only lime-casein and borax-casein are permitted as binding agents.

The use of preservatives/preserving agents is forbidden. With regard to the recommended application, the amount of anorganic white pigments of artificial origin is restricted to 38 g/m².

The following substances must not be added to the product:

- softening agents (according to VdL-GL 01)
- glycol compounds
- APEOs (alkylphenol ethoxylates)



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- halogenic organic compounds
- organic tin compounds
- azo dyes resulting in carcinogenic amines
- biocides not used for in-can conservation (film preservatives)
- halogenated isothiazolinones
- formaldehyde releasing substances

The product must not be prepared with pigments and siccatives based on lead, cadmium, chrome VI and their compounds. Pigments posing ecological and toxicological problems, e.g Naples yellow, are not permitted.

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. For raw materials on a mineral basis and mineral fillers, the raw material extraction must be achieved in a resource conserving manner as laid down in GL-5003. Evidence of compliance needs to be provided. If titan dioxide is employed, it must correspond with EU-GL 92/112/EWG.

Proof must be provided of the measures taken to avoid the incidence of bacterial contamination (industrial hygiene) in the selection of raw materials and the production process.

Dairy waste water must comply with the applicable limits (analogue to the framework document for waste water management regulations (Rahmen-AbwVwV) according to § 7a of the German Water Resources Act (Wasserhaushaltsgesetz WHG), 1993, appendix 3, milk processing).

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.

2.5 Recycling/Disposal

Proof of a suitable recycling system for product leftovers must be provided. The paint must be suitable for composting.



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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 m ²	Guide values ¹
Primary energy input of non renewable total resources (PENRE ²) [MJ]	18
Primary energy input of non renewable and renewable total resources (PET ³) [MJ]	20
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,00075
Acidification potential (AP) [kg SO ₂ -equiv.]	0,005
Eutrophication potential (EP) [kg PO ₄ ³⁻ -equiv.]	0,002
Global-warming potential (GWP) [kg CO ₂ equiv.]	0,9
Abiotic depletion potential (ADP) [kg Sb equiv.]	0,00000075

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



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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.

- pH-value
- Consumption data per m²
- Durability, storage properties, necessary storage conditions
- Yield (surface coverage power) according to DIN EN 13300
- Wet abrasion resistance according to DIN EN 13300
- For paints in powder form – the packaging must contain instructions for mixing the paint

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 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	$\mu\text{g}/\text{m}^3$
Total volatile organic compounds (TVOC)	≤ 3000	$\mu\text{g}/\text{m}^3$

Emission measurement after 28 days

Test parameters	Limits	Unit
Total volatile organic compounds (TVOC)	≤ 300	$\mu\text{g}/\text{m}^3$
of which:		
Total bicyclic terpenes	≤ 200	$\mu\text{g}/\text{m}^3$
Total sensitising substances per MAK IV, BgVV-list cat. A, TRGS 907	≤ 100	$\mu\text{g}/\text{m}^3$
Total VOC (VOC, VVOC, SVOC) classified in:	≤ 50	$\mu\text{g}/\text{m}^3$

Regulation (EC) No. 1272/2008: Categorie Carc. 2, Muta 2, Repr. 2; TRGS 905: K3, M3, R3; IARC: group 2B; DFG MAK-list: III3		
Total aldehyde, C4-C11, acyclic, aliphatic	≤ 100	µg/m ³
Styrene	≤ 10	µg/m ³
Methylisothiazolinone (MIT)	< 1	µg/m ³
Benzaldehyde	≤ 20	µg/m ³
Total (VOC) without non-identified compounds	≤ 100	µg/m ³

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/m ³
Formaldehyde	≤ 24 ⁽¹⁾	µg/m ³
Acetaldehyde	≤ 24 ⁽¹⁾	µg/m ³

⁽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 values	Unit
Arsenic (As)	≤ 5	mg/kg
Cadmium (Cd)	≤ 1	mg/kg
Cobalt (Co)	≤ 20	mg/kg
Mercury (Hg)	≤ 1	mg/kg



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Nickel (Ni)	≤ 20	mg/kg
Lead (Pb)	≤ 15	mg/kg
Zinc (Zn)	≤ 150	mg/kg

3.3 Other Analyses

Test parameters	Limit values	Unit	Method
Chromium VI (Cr VI)	≤ 1	mg/kg	TRGS 613
Halogenic organic compounds: AOX/EOX	≤ 1	mg/kg	TM-03 Halo
pH value	≤ 12,5		ISO 10390
Odour	≤ 3	Odour intensity	TM-04 Odour

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

Appendix

Test parameters for paints containing coloured pigments and tinting paints

If the composition of the coloured paints or tinting paints (with the exception of the colorant components) is identical to the un-pigmented / white paints, then they will only be tested for the following parameters:

- Metals and Metalloids (according to each colour)
- Carcinogenic Amines from Azo dyes/colorants (if required/suspected)

Parameter	Limit value	Unit	Method
Carcinogenic Amines from Azo dyes	≤ 10	mg/kg	according to LFGB

Simplified Procedure

The pigments are directly analysed for their metal content. The manufacturer must supply a list of all the pigments employed (brand name, chemical structure, CAS-number, safety data sheet). These pigments are chemically classified and combined into logical groups for mixed samples.

Content Analysis

The elements arsenic, lead, cadmium, mercury and thallium will be solubilised through complete dissolution and measured according to the natureplus implementation procedure. The decomposition of pigments based upon organic colorants is accomplished by means of a pressure digestion system using nitric acid. Pigments based upon inorganic starting compounds will be solubilised by means of a pressure digestion system using a nitric acid/hydrofluoric acid mixture.

The applicable threshold values for this analysis are calculated based upon the threshold values of this guideline for the colourless product according to the following formula:

Threshold value of the element⁽¹⁾ = (100 / divided by the number of pigments in the mixed sample) / average percental input of the colorant.

If the threshold value is exceeded, an analysis of the individual pigments must be performed.

Eluate determination

For the metals antimony, barium, chrome, cobalt, copper, nickel and tin, which are classified as harmful, the analysis of the soluble proportion is to be preferred over the analysis of the



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total content. The eluate is produced as per DIN EN 71 Part 3 by means of the elution method using a gastric acid-substitute solution.

⁽¹⁾ Threshold value Thallium 2 mg/kg. For other element limits see the table under section 3.