

natureplus e.V.

Award Guideline 0803

## **Loam/Clay Based Mortar**

Issued: June 2015

For the Awardance of the Eco-Label





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Version: June 2015

Page 2 of 9

## 1. Application Areas

The following criteria contain the requirements for the awardance of the natureplus eco-label for loam/clay mortar for interior applications with a minimum coating thickness of 5mm. This award guideline is to be applied exclusively to the named products. Products which are used for the coloured design, decoration or configuration of the interior or products with a coat thickness of under 5mm are covered in the natureplus award guideline GL-0607 "Loam/Clay Paints and Thin Layer Loam/Clay Plaster Coatings".

Plaster/mortar which contains binding agents other than clay or loam/clay are covered in the natureplus award guideline GL-0804 "Stabilised Loam/Clay Mortar".

## 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. The product must fulfil the criteria of the Loam Construction Regulations of the umbrella organisation "Lehm e. V., Weimar".

### 2.1 Suitability of Application

The following points must be certified by an appropriate testing institute:

- A measurement of the dry shrinkage (mm/m) according to DIN 1060 part 3 with a spread measure of 140 mm instead of 180 mm
- The sorption capacity measured upon reaching a moisture equilibrium level of 50% relative humidity and 21°C and increasing the relative humidity to 80% in time intervals of 0.5; 1.5; 3; 6; 12; 24; and 48 hours.
- The flexural tensile strength DIN EN 196-1 in N/mm<sup>2</sup>
- The compression resistance according to DIN EN 196-1 (Test Sample 40 x 40 x 40 mm) in N/mm<sup>2</sup>
- The abrasion resistance g (See the appendix for the method employed)



## Award Guideline 0803 Loam/Clay Based Mortar Version: June 2015

Page 3 of 9

### 2.2 Composition, Forbidden Substances, Substance Restrictions

The product must be made from 100 M-% from mineral and renewable raw materials. Only clay and loam/clay are permitted as binding agents.

In particular, the following materials may not be used in the loam/clay mortar:

- Biocides
- Halogen-organic compounds
- Synthetic materials and fibres (e.g. Acrylate, Polyvinyl acetate)
- Lime, gypsum and cement as binding agents
- Cellulose and carbohydrate derivatives

Furthermore, the following substances must not be added to the product:

- glycol ether and esters
- APEOs (alkylphenol ethoxylates)
- halogenated isothiazolinones
- formaldehyde releasing substances

Only pigments prepared from iron oxides or anorganic substances with comparable or less toxicity may be added to the product. Pigments posing ecological and toxicological problems prohibited as per GL-5001, e.g. Naples yellow or metal compounds, 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. If mineral raw materials are used, the requirements of GL-5003 must be complied with. Evidence of compliance needs to be provided. If titan dioxide is employed, it must correspond with EU-GL 92/112/EWG.

If secondary raw materials are used, the product may if required, be tested for material specific parameters.

### 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.



# Award Guideline 0803 Loam/Clay Based Mortar Version: June 2015

## 2.5 Recycling/ Disposal

Proof must be provided that the products can be recycled (compliance with the requirements of the functional suitability).

The components must be suitable for disposal in an inert materials disposal site/facility according to the “Decision of the EU council of the 19<sup>th</sup> 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 of the guideline 1999/31/EG”.

## 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 <sup>2</sup> x cm	Guide values <sup>1</sup>
Primary energy input of non renewable total resources (PENRE <sup>2</sup> ) [MJ]	21
Primary energy input of non renewable and renewable total resources (PET <sup>3</sup> ) [MJ]	25
Photochemical ozone creation potential (POCP) [kg ethylen-equiv.]	0,0006
Acidification potential (AP) [kg SO <sub>2</sub> -equiv.]	0,005
Eutrophication potential (EP) [kg PO <sub>4</sub> <sup>3-</sup> -equiv.]	0,0018
Global-warming potential (GWP) [kg CO <sub>2</sub> equiv.]	1,3
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.

<sup>1</sup>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

<sup>2</sup> PENRE: **p**rimary **e**nergy input of **n**on renewable **e**nergy resources

<sup>3</sup> 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 quantity of the organic aggregates
- Consumption data
- The dry shrinkage measurement in mm/m; including processing/handling instructions if necessary
- Details of the flexural tensile strength.
- Details of the compression resistance according to EN 988-1.
- The pH-Value.
- The sorption capacity after 1.5 and 12 hours.
- Details of the abrasion resistance
- A warning note: Surface treatments may influence the sorption capacity.
- Information to the guarantee terms and guarantee period
- Minimum durability



## Award Guideline 0803 Loam/Clay Based Mortar Version: June 2015

Page 6 of 9

If the loam/clay mortar is not sold or distributed exclusively by trained specialists, then the manufacturer must make reference on the product to possible serious processing/handling errors (i.e. the addition of excess amounts of water or an insufficient drying period).

### 2.9 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 and to determine both TVOC and TSVOC. Measurements 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)	$\leq 3000$	$\mu\text{g}/\text{m}^3$

**Emission measurement after 28 days**

Test parameters	Limits	Unit
Total volatile organic compounds (TVOC)	$\leq 300$	$\mu\text{g}/\text{m}^3$
of which:		
Total bicyclic terpenes	$\leq 200$	$\mu\text{g}/\text{m}^3$
Total sensitising substances per MAK IV, BgVV-list cat. A, TRGS 907	$\leq 100$	$\mu\text{g}/\text{m}^3$
Total VOC (VOC, VVOC, SVOC) classified in:  Regulation (EC) No. 1272/2008: Kategorie Carc. 2, Muta 2, Repr. 2; TRGS 905: K3, M3, R3; IARC: group 2B; DFG MAK-list: III3	$\leq 50$	$\mu\text{g}/\text{m}^3$
Total aldehyde, C4-C11, acyclic, aliphatic	$\leq 100$	$\mu\text{g}/\text{m}^3$
Styrene	$\leq 10$	$\mu\text{g}/\text{m}^3$
Methylisothiazolinone (MIT)	< 1	$\mu\text{g}/\text{m}^3$
Benzaldehyde	$\leq 20$	$\mu\text{g}/\text{m}^3$
Total (VOC) without non-identified compounds	$\leq 100$	$\mu\text{g}/\text{m}^3$

A calculation of the r-value is performed. The limit value is  $\leq 1$ .

**Other emission measurements after 28 days**

Test parameters	Limit values	Unit
Total semi-volatile organic compounds (TSVOC)	$\leq 100$	$\mu\text{g}/\text{m}^3$
Formaldehyde	$\leq 24^{(1)}$	$\mu\text{g}/\text{m}^3$
Acetaldehyde	$\leq 24^{(1)}$	$\mu\text{g}/\text{m}^3$

(1)  $24 \mu\text{g}/\text{m}^3 \approx 0,02 \text{ ppm}$

**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)	≤ 1	mg/kg
Cobalt (Co)	≤ 20	mg/kg
Chromium (Cr)	≤ 20	mg/kg
Copper (Cu)	≤ 35	mg/kg
Mercury (Hg)	≤ 0,5	mg/kg
Nickel (Ni)	≤ 20	mg/kg
Lead (Pb)	≤ 15	mg/kg
Antimony (Sb)	≤ 5	mg/kg
Tin (Sn)	≤ 5	mg/kg
Zinc (Zn)	≤ 150	mg/kg

### 3.3 Other Analyses

Test parameters	Limit values	Unit	Method
Halogenic organic compounds: AOX/EOX	≤ 2	mg/kg	TM-03 Halo
pH value	≤ 12,75		ISO 10390
Odour	≤ 3	<b>Odour intensity</b>	TM-04 Odour





**Award Guideline 0803**  
**Loam/Clay Based Mortar**  
Version: June 2015

<b>Radioactivity</b>			
Artificial radioactivity Cs-137	not measurable		
Natural radioactivity: total avalue according to ÖNORM S 5200	$\leq 0,75$	<b>Bq/kg</b>	

## 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