

Dr. Upmeier

Sachverständigenbüro

Sachverständigenbüro Dr. Martin Upmeier
Diplom-Geologe

von der Landwirtschaftskammer
Rheinland-Pfalz öffentlich bestellter und
vereidigter Sachverständiger im Bereich
Gartenbau für:

- Garten und Landschaftsbau –
Herstellung und Unterhaltung,
Teilbereich Schwimm- und
Badeteiche
- Dach- und Bauwerksbegrünung
- Qualität von Erden und Substraten

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Lower Broadbridge Farm
Billingshurst Road, Broadbridge Heath
West Sussex, RH12 3LR

Dattenberg, 23.11.2022

Test report according to FLL-Green-Roofing Guidelines (2018)

Test report number: PG-2022-0050

Extensive roof substrate (single layer construction)

Sample number: EP-2022-0186

The material sample is compliant with the FLL Green Roofing Guidelines (2018).

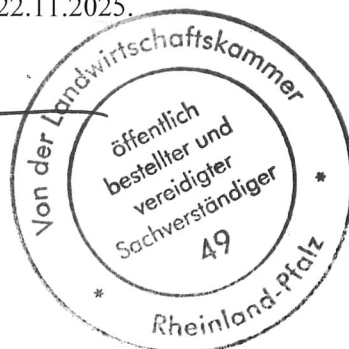
Note on nutrients: The plant available nutrients phosphorus and potassium are (CAT-extract) are slightly increased. This is not a problem from a vegetation-technical point of view.

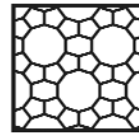
Note on salinity: An increased level of salinity in water was detected. When this occurs, an additional measurement in saturated gypsum solution is tested. The value for this measurement fulfils the FLL-requirement. Therefore, the high salinity in water is caused by sulphate, which in this concentration is not detrimental to plant growth.

The test report includes 3 pages (this page, test report (2 pages)).

The test report is valid until 22.11.2025.

Dr. Martin Upmeier





Substrat analysis according to FLL-Green-Roofing Guidelines (2018)

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Material name: Extensive Green Roof Substrate

Type of substrate (FLL): Extensive roof substrate (single layer construction)
Declaration of ingredients: no information
Production facility: no information
Place of sampling: no information
Type of sampling: no information
Sample size: approx. 25 l
Date of sampling: 17.10.2022
Sampler: John Coles
Date laboratory delivery: 14.11.2022
Sample number: EP-2022-0186
Laboratory processing: Dr. Martin Upmeier, Susanne Hess
Date test report: 23.11.2022

Analysis results

Properties	Unit	Value according FLL	Analysis value
Grain size distribution			
Elutriate particles (d ≤ 0,063 mm)	weight-%	≤ 10	2
Medium gravel (d > 4 mm)	weight-%	≤ 75	62
Weight per volume ¹⁾			
In dry condition	g/cm ³	-	0,92
At maximum water capacity	g/cm ³	-	1,26
bulk density (DIN EN 1097-3)	g/cm ³	-	0,87
Water / air conditions			
Total pore volume ¹⁾	Vol.-%	-	64
Maximum water capacity	Vol.-%	≥ 20 bis ≤ 65	34
Air content at maximum water capacity	Vol.-%	≥ 10	30
Air content at pF 1,8 ³⁾	Vol.-%	≥ 20	n.d.
Hydraulic permeability mod. Kf	mm/min	60 - 400	248
pH-value, salinity			
pH-value (in CaCl ₂)		6,0 - 8,5	7,6
Salinity (water extract), expressed as KCl ²⁾	g/l	≤ 3,5	9,5
Salinity (gypsum extract) ³⁾	g/l	≤ 2,5	1,3

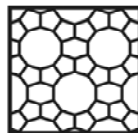
¹⁾ No requirement

²⁾ A low value should be aimed

³⁾ To be proofed, if necessary

Test report

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Expert office

Material name: Extensive Green Roof Substrate
 Sample number: EP-2022-0186

Properties	Unit	Value according FLL	Analysis value
Organic substance			
organic matter content (loss on ignition)	g/l	≤ 40	27,4
loss on ignition	weight-%	-	3,0
Plant available nutrients (CAT)			
Nitrogen (N)	mg/l	≤ 80	<2
Phosphorus (P ₂ O ₅)	mg/l	≤ 50	76
Potassium (K ₂ O)	mg/l	≤ 500	583
Magnesium (Mg)	mg/l	≤ 200	107
readable impurities			
Diameter > 6 mm			
Tiles, glass, ceramics	weight-%	≤ 0,3	0
Metal, plastic	weight-%	≤ 0,1	0
Area sum for plastics	cm ² /l	≤ 10	0

The investigations were carried out in accordance with relevant testing methods, designated in the FLL-Green-Roofing Guidelines 2018

All parameters are related to a defined laboratory compaction (FLL-Green-Roofing Guideline).

n.d.: value not determined

