

REPORT

Client	N-TROPIE 3900 Pelt Belgium
Date of report	12/07/2022
Regard	Report, partly testing according to FLL guidelines
Object	Zeolithe / Tuff 1/12 mm

Note on Subcontracting

In individual cases test results have been determined in the context of the subcontracting

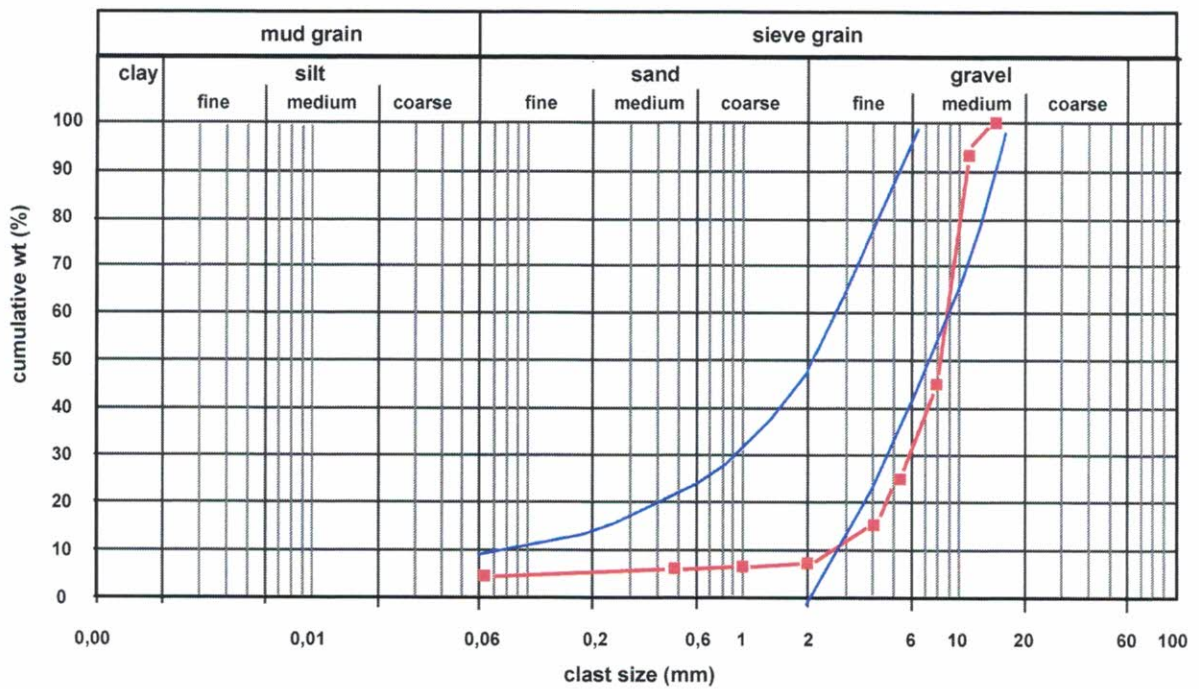
- LUFA NRW Labor für Agrar- und Umweltanalytik
- Materialprüfungs- und Versuchsanstalt Neuwied
- Eifelinstitut Laboratorien für Materialprüfung
- Dr. Ing. Stephan Roth-Kleyer, Sachverständiger Garten- und Landschaftsbau

Physical and chemical analysis

Determination	Unit	Measured value	Normal state
dry bulk density	Md [g/cm ³]	0,8	0,7 – 0,9
bulk density (max. capacity of water)	Md [g/cm ³]	1,19	1,1 – 1,36
dampish bulk density	Md [g/cm ³]	0,97	0,9 – 1,1
deviation from target value (Md)	% [g/cm ³]	+/- 15	
grain size distribution Md [g/cm³]			
(d=<0,063 mm)	[mass.-%]	4,8	≤ 10
(d=>11,2 mm)	[mass.-%]	6,7	≤ 10
total porosity	(vol.-%)	68,5	30 - 65
water capacity WK max.	(M.-%)	32,8	
air pore volume at water content max.	(vol.-%)	37	
water absorption	(M.-%)	23,7	
water permeability mod Kf.	mm/min	>450	60-400
adsorption capacity	mmol/z/l	139	
organic matter content	[M.-%]	< 0,1	
salinity	g/l	0,08	≤ 2,5
carbonate content	g/l	0,12	
ph-value (CaCl ₂)		6,85	5,5 - 8,5
nutrient			
adsorption capacity	mmol/z/l	207	>60
Plant available nutrients			
phosphate content (P ₂ O ₅)	mg/l	43	≤ 200
magnesium content (Mg)	mg/l	59	≤ 200
nitrogen content - easily soluble (N)	mg/l	12	≤ 80
potassium oxide content (K ₂ O)	mg/l	348	≤ 700
total sulfur (S)	[M.-%]	0,027	
water-soluble chlorides	[M.-%]	0,001	

Particle size distribuion

particle size (mm)	mass fractions (M.-%)	mass passage (M.-%)
31,5	(-)	(-)
22,4	(-)	(-)
16	(-)	100
11,2	6,7	93,3
8	47,0	46,3
5,6	21,1	25,2
4	11,2	14,0
2	5,9	8,1
1	1,2	6,9
0,5	0,9	6,0
0,063	1,2	4,8
<0,063	4,8	



Grain size distribution range for
single-layer extensive substrate

**Zeolithe/Tuff
1-12 mm**

Heavy metals

Sample: Zeolithe / Tuff

Parameter	Requirements	Result
Heavy metals	mg/kg	mg/kg
Cadmium (Cd)	1,5	< 0,20
Copper (Cu)	50	17
Mercury (Hg)	1	0,01
Lead (Pb)	50	9
Nickel (Ni)	56	4
Zine (Zn)	300	154