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Coefficient of permeability is the most important design parameter of clays and geosynthetic clay liners (GCLs) for landfill liner applications. It can be determined using conventional (constant- or variable-head method) or modern test methods like flow-pump testing (Veinovic et al., 2003). By applying flow-pump method, permeability measurements can be obtained much more precisely and rapidly, which is particularly important for low permeable and soft materials.

In our study, samples of one type of reinforced GCL were tested for the determination of permeability by two methods: constant-head (samples 1 and 2) and flow-pump (samples 3 and 4). The obtained values of permeability were quite similar in both cases. The major advantage of flow-pump method was that the duration of permeability testing phase was only several hours comparing to several days in case of constant-head method (Blazevic, 2007).

Sample	Effective stress (kPa)							
	35				70			
	L (mm)	□u (kPa)	i	k (m/s)	L (mm)	□u (kPa)	i	k (m/s)
1	8.4	15	182	1.76E-11	7.36	15	208	8.66E-12
2	8.4	15	182	1.69E-11	7.45	15	205	6.66E-12
3	9.22	10	111	1.38E-11	8.69	21	246	1.18E-12
4	10.20	11	110	1.85E-11	9.03	22	258	1.13E-12

References:

BLAZEVIC. M. (2007): Determination of GCLs hydraulic conductivity by laboratory testing. Graduation thesis. University of Zagreb. 35 p.

VEINOVIC. Z.. KOVACEVIC ZELIC. B. & KVASNICKA. P. (2003): Advantages and disadvantages of modern laboratory coefficient of permeability measurement on soil materials. Mining-geology-petroleum Engineering Bulletin 15, 95-102.