Quantum Chemical

Mar. 17, 2016

Western Engineered Containment

To whom it may concern,

In response to your enquiry about the hydraulic conductivity (K) of PRECIDIUM™ ECS Polyurea, or polyureas in general, I can offer the following information. Hydraulic conductivity measures the permeability of materials such as soils and clays; its use in geomembrane requirements is a leftover from the use of compacted clay liners where permeability rate was governed by head pressure and was reported in cm/second.

Permeability in polymer liners is driven by Fick's Law where the concentration gradient across the liner drives the process and cannot be represented in cm/second as diffusion occurs due to the travel of single molecules through the liner.

Hydraulic conductivities of polymer liners are very low. Attempts to measure K come up with 1×10^{-12} to 1×10^{-15} cm/second but no standard procedure really exists to do this measurement.

Most geomembrane specifications which require a hydraulic conductivity are looking for 10^{-6} to 10^{-9} cm/second. During my career I have used 10^{-12} cm/seccond as a generic value of K for a polymer liner. Being more specific, in my opinion, is not realistic.

Permeability for a polymer liner is generally reported as grams/m2/day.

If you or any of your clients want to discuss further, please contact me.

Sincerely,

Dave Martin, P.Eng

PROFESSIONAL ENGINEER ALBERTA
DAVE MARTIN

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