

Foam Filtration Spring 2011

Foam Filtration Current Research

Foam Filtration Design

Our team is working on finalizing the design for the point-of-use foam filtration unit. Different designs for the filtration unit are being considered and researched thoroughly. Most of the work we have done thus far is focused on the specific design of the alum doser and methods of incorporating this dosing component into the overall system. Initially, a "continuous" dosing design was proposed, but due to many problems associated with the design, the team decided to instead go with a "batch" dosing system, whereby the user would manually add alum and chlorine into the holding tank and distribution tank respectively and then stir. An analysis of each proposed design for the filter was conducted using MathCAD in order to determine its feasibility from a quantitative standpoint. There were plans to fabricate a prototype of the filter by the semester's end, however, plans to refocus on the revisions of a research paper have prevented this from happening.

Head Loss Calculations

Research from fall 2010 was continued in hopes of determining the head loss through foam as a function of filter run time. We were also interested in determining the head loss at filter collapse.

Varying Influent Turbidity

In order to determine conditions under which a polyurethane foam filter can successfully filter water to below U.S. standards of 0.3 NTU, performance of the filter with various influent turbidities must be evaluated. Ranges of turbidity from 5 NTU to 50 NTU will be tested with 30, 60 and 90 ppi foam.

Physical Compression Test

To determine the force and corresponding pressure that causes compression in foam, we conducted a physical compression test using 90 ppi foam samples. Finding the range of pressures that symbolize the start of compression and end of compression in the samples can help our team estimate the pressures at which our full-scale foam column will collapse. By having maximum allowable pressure estimates, we can more accurately develop a point-of-use filtration unit that will avoid a decrease in performance due to compression.