

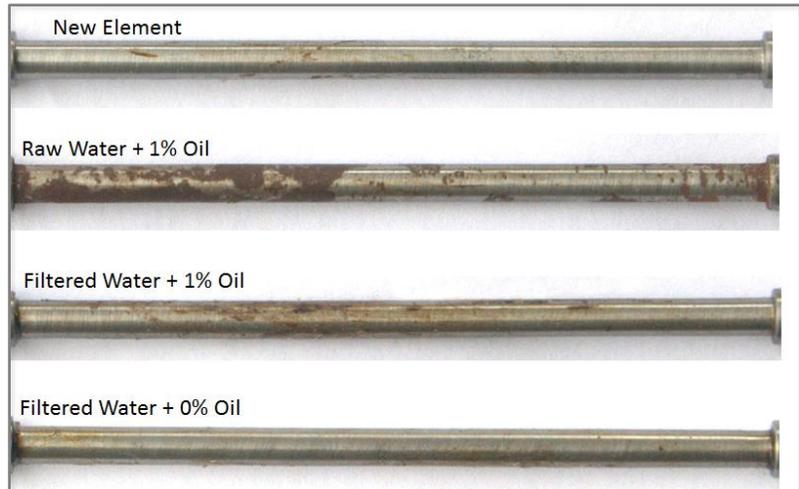
Fouling Tests & Evaluation in Liquid Streams

Fouling, or the accumulation of solid material on a surface, is an increasingly prevalent and challenging problem in most processing plants across many industries. The costs associated with fouling problems have been estimated at over \$4 billion per year in the United States alone. Filter plugging and reduced lifetime, reduced heat transfer in heat exchangers, column packing deterioration, and reduced throughput are just a few of the harmful effects caused by fouling.

The tendency of a fluid to foul process equipment is related to many factors, and predicting this tendency based on process conditions and stream quality is a speculative and inaccurate science. The most accurate method for determining fouling tendencies is a representative simulation of process conditions. One of the most accurate laboratory tests to determine fouling tendencies of a process fluid is called the Hot Liquid Process Simulator (HLPS). The HLPS is a small scale dynamic process simulation used to mimic fouling and determine tendencies in a laboratory setting.

Case Study

The HLPS was used to determine the fouling tendencies of an aqueous stream with high amounts of solid and hydrocarbon contamination. An unaltered sample was analyzed in addition to a filtered sample and a filtered, hydrocarbon-extracted sample. The study shows that differential temperature was greatly reduced after hydrocarbon removal. The differential temperature was not significantly reduced in testing of the filtered sample, suggesting that contrary to original beliefs, the hydrocarbon contamination was primarily responsible for fouling issues at the plant. Visual inspection of the test elements support the measured results as hydrocarbon deposits were observed on element used when non-extracted samples were processed (see figure). With this analysis, plant engineers were able to proceed with a better solution for fouling reduction by improving hydrocarbon removal in addition to solids filtration.



HLPS analysis can be used to predict fouling tendency in unmonitored streams, produce fouling material for further analysis, or proactively determine the best feedstock for processing. In relation to filtration and other separation processes, fouling tendency analysis is useful for determining the correct treatment method for fouling problems; the system can be used to determine fouling tendencies of streams before and after treatment methods are applied. With precise simulation of plant conditions using actual process fluids, the HLPS produces accurate and invaluable information related to liquids processing, fouling tendencies and potential mitigation strategies.

For more information, please contact us at Support@NexoSolutions.com