Modeling the Effect of Tramp Oil Contamination on Selective Component Depletion in Metalworking Fluid Systems

Metalworking fluids are designed to perform specific tasks in the factory. However, these fluids can become contaminated during the manufacturing process by other factory components such as tramp oil. As more and more tramp oil contaminates the metalworking fluids, the less effective the fluids become, resulting in degraded products. To predict the contamination rate and thus have a tank-side timed application of oil remover, the researcher developed a predictive model. This model was run under several scenarios and compared with controlled lab tests and published industrial systems. The experiments showed that the tramp oil being added to the system indeed had an impact on the effectiveness of the metalworking fluid. The model also correlated well with lab and published data, and therefore, the authors recommended that this technology be implemented to expand the life of metalworking fluids.