Purification of SemiSynthetic Metalworking Fluids by Microfiltration

Since the early 2000s, industries have faced rising costs to acquire, manage, and dispose of metalworking fluids, as well as increased concern about pathogenic bacteria growing in metalworking processes. The need to reduce the impacts of these bacteria prompted ISTC's Kishore Rajagopalan and colleagues to find a solution that would meet both environmental health and metalworking fluid reuse standards. They discovered that microfiltration was the key to achieving their goal. Using an α-alumina membrane of 0.5 µm pore size, they could effectively remove emulsified tramp oil, which is a common contaminant in metalworking fluid. They also observed a 7-log reduction in bacteria, which should result in a 50–99% reduction in endotoxins.

Contaminants

Aquatic Plastic Debris

Metals

Metalworking Fluids

A Turbidimetric Method for the Rapid Evaluation of Metalworking Fluids Emulsion Stability

An Evaluation of the Colloidal Stability of Metalworking Fluid

Development of a Novel Metalworking Fluid Engineered for Use with Microfiltration Recycling

Engineering of Ultrafiltration Equipment in Alkaline Cleaner Applications

Formulation and Testing of a Microfiltration Compatible Synthetic Metalworking Fluid

Impact of Environmental Contaminants on Machining Properties of Metalworking Fluids

Ingredient-Wise Study of Flux Characteristics in the Ceramic Membrane Filtration of Uncontaminated Synthetic Metalworking Fluids

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

Partial Pore Blocking in Microfiltration Recycling of a Semisynthetic Metalworking Fluid

Purification of SemiSynthetic Metalworking Fluids by Microfiltration

The Effect of Chip Adsorption on Selective Depletion from a MultiComponent Synthetic Metalworking Fluid

Per- and Polyfluoroalkyl Substances (PFASs)

Agricultural Chemicals

PPCPs in the Environment

PCBs & PBDEs

Polycyclic Aromatic Hydrocarbons (PAHs)

Energy

Resource Recovery

Water

Instruments & Equipment

Sponsored Research Program

Meet the Scientists

Kishore Rajagopalan