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## Impact of Environmental Contaminants on Machining Properties of Metalworking Fluids

In the mid-2000s, metal products manufacturing costs were increasing. With the discovery that metalworking fluids cost about 12% of the machining costs, many manufacturers have begun recycling their metalworking fluids back into their processes. Recycling has the added bonus of reducing the environmental burden on manufacturers who dispose of less fluid.

But how do contaminants impact the productivity of metalworking fluids? ISTC's Kishore Rajagopalan and his colleague explored this question for tramp oils, salts, and other contaminants. They found that metalworking fluids had no losses in cooling and lubricating functionality until calcium built up so high that the ions caused the emulsion to destabilize. Metal surface roughness showed no difference between fresh and contaminated metalworking fluids. However, the corrosion inhibitor was affected due to the various fluid formulations interacting differently with the contaminant chloride.

### 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](#)

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[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](#)

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### Meet the Scientists

[Kishore Rajagopalan](#)

### Publications

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