

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

Some metalworking fluids are designed to coat the surfaces of newly machined metal with rust inhibitors. At some point, these inhibitors are expected to become depleted in the metalworking fluid. How quickly does this happen and can the depletion be predicted by a model? ISTC researcher Kishore Rajagopalan and colleagues from the University of Illinois at Urbana-Champaign devised a predictive model and verified experimentally that the model does indeed accurately predict the inhibitor depletion. They also conducted a pilot study to show the predictive model in use in an industrial application and verified that other components in the metalworking fluid did not interfere with the adsorption of the inhibitor. With this technology, manufacturers can predict when inhibitor levels will be low and add fresh components to maintain optimum coating conditions in the metalworking fluid baths.

- 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

## Publications

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