1.0 INTRODUCTION

Cutting fluids have been used extensively in metal cutting operations for the last 200 years. In the beginning, cutting fluids consisted of simple oils applied with brushes to lubricate and cool the machine tool. Occasionally, lard, animal fat or whale oil were added to improve the oil's lubricity. As cutting operations became more severe, cutting fluid formulations became more complex. Today's cutting fluids are special blends of chemical additives, lubricants and water formulated to meet the performance demands of the metalworking industry.

There are now several types of cutting fluids on the market, the most common of which can be broadly categorized as cutting oils or water-miscible fluids. Water-miscible fluids, including soluble oils, synthetics and semisynthetics, are now used in approximately 80 to 90 percent of all applications [1]. Although straight cutting oils are less popular than they were in the past, they are still the fluid of choice for certain metalworking applications.

Cutting fluids play a significant role in machining operations and impact shop productivity, tool life and quality of work. With time and use, fluids degrade in quality and eventually require disposal once their efficiency is lost. Waste management and disposal have become increasingly more complex and expensive. Environmental liability is also a major concern with waste disposal. Many companies are now paying for environmental cleanups or have been fined by regulatory agencies as the result of poor waste disposal practices.

Fortunately, cutting fluid life may be extended significantly by implementing an effective fluid management program. The primary objective of fluid management is to maintain fluid quality and performance through administration, monitoring, maintenance and recycling practices. This allows machine shops to make the most cost-effective use of their fluid. It is also the best pollution prevention technology available. Overall, fluid management provides a means to:

- ✔ Operate in a more environmentally sound manner;
- ✔ Improve productivity and reduce costs;
- ✔ Increase competitiveness;
- ✔ Maintain environmental compliance and reduce environmental liability;
- ✔ Consistently manufacture quality products; and
- ✔ Provide a healthier and safer work environment for employees.

Proper management of cutting and grinding fluids may also prevent them from being declared a hazardous waste at the end of their useful life. With increasing environmental regulation, a reduction in cutting fluid waste is an economical, practical and achievable goal.