



## Maintenance of Water-Soluble Machining Coolants During Use

Proper mixing of the soluble oil and water is necessary if a good emulsion is to be formed. The oil should always be added to the water and mixed well. If the reverse is done, an inverted emulsion may be formed which is unsatisfactory.

The application of soluble oils in a machine involves a large number of variables, such as type of water used, plant cleanliness, preparation of emulsion, condition in machine, type of metal, etc. The following corrective measures are helpful in eliminating certain adverse conditions:

1. Remove any oil layer on the surface of the emulsion to prevent insulation from the air.
2. Remove chips or fines from machines at frequent intervals. The use of filters of all types are very useful to accomplish this and often are cost-justified in money saved on labor to clean machines and longer coolant life in machines.
3. Clean the machine coolant reservoir and system periodically with a good machine cleaner like Keystone's KeyKleen Machine Sump Cleaner.
4. Aerate the emulsion frequently to remove dissolved toxigenic gases that collect in reservoirs that are not used continuously.
5. Check emulsion concentration at frequent intervals. Generally there is a definite concentration at which the job works best, and changes in concentration are usually reflected in shorter tool life. The method generally used is to take a graduated cylinder or soluble oil flask and fill to desired level. Add a few drops of hydrochloric acid and agitate well. The oil will rise to the surface and the concentration can be calculated or read on scale, depending on whether a cylinder or flask was used.

Rancidity and offensive odors sometimes develop during the use of soluble oils. Generally these conditions exist when bacteria count is high. These bacteria may come from sweepings off the floor, from workers who wash hands in coolant, and many other ways. If these bacteria have enough time to go to work, a rancid emulsion develops.

During weekend shutdowns, and especially if the emulsion is covered with an oil blanket, there is greater chance for the development of offensive odors. When emulsions go rancid, or develop offensive odors, the best thing to do is to drain machine of coolant, add machine cleaner with a germicide, and clean machine. Investigations should also be started to find the cause of the rancidity.

## Recommended Procedure For Refilling a Coolant System

### Machine Tool Preparation Before Coolant Refilling

1. Add 10% KeyKleen by volume to old coolant, circulate and discard.
2. Manually clean all solids from coolant reservoir.
3. Rinse system with 10 parts water to one (1) part KeyKleen, drain and discard.
4. Flush the system with water and drain.
5. Change or clean filtration system if applicable.
6. Charge the system with new coolant.

### Coolant Mixing and Refilling

1. Mix emulsions of coolant in a separate, clean mixing tank rather than in sump of machine tools.
  - a) Fill mixing container with  $\frac{1}{2}$  required amount of water for the recommended dilution.
  - b) While the water is being agitated with a paddle, propeller, or compressed air, slowly add the full amount of coolant concentrate to be used. Remember: **Always add the oil to the water.**
  - c) When the water is completely mixed, add the balance of the water.
2. Charge system with new coolant.

### Weekly System Maintenance

1. Avoid introduction of any foreign matter into coolant system, i.e., rubbish, food scraps, dirty rags, and tramp oil, if possible.
2. Mechanically arrange the system to the coolant is continuously aerated as it is circulated.
3. Change or clean coolant filtration systems if applicable.