Mau-Sherwood Supply Company

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Why control bacteria…

they chemically alter coolants, destroy the lubricants and corrosion inhibitors and they pass off corrosive acids and salts into the coolant. If left unchecked bacteria can play havoc with your water miscible coolants, leading to poor tool life, as well as rust and rancidity problems. However, a better understanding of how and why they multiply will enable you to take preventative action. Bacteria generally get into the fluid via one or more of the following means:

1. The water used for mixing.
2. "Sludge" in the machine tool sump.
3. The parts being machined.
4. The air.
5. The operator's hands.
6. Food scraps etc.

The majority of bacteria need oxygen to grow (aerobic bacteria). Most of them reproduce by dividing in two approximately every 20-30 minutes. The table assumes starting with one bacterium, splitting every 20 minutes and that all survive during that time. This illustrates how rapidly bacteria can overwhelm your sump if given the opportunity.

1 Hour	8
3 Hours	512
6 Hours	262,000
9 Hours	134,000,000
10 Hours	268,000,000
11 Hours	516,000,000
12 Hours	1,032,000,000

⇨ Improper coolant concentration is the number one failure mechanism of coolants.

In general, there are two aerobic bacteria with which we are most concerned, and that are the most troublesome. One type of aerobic bacteria prefer oil as a food source, so they tend to grow rapidly in those machines which leak substancial amounts of lubricating and hydraulic oils. Therefore, everything should be done to reduce such oil leakage or take steps to remove the oil after it has contaminated the system or choose an oil that has less of a negative impact on the system.

⇨ Tramp oil is the number two failure mechanism of coolants.

The other type of aerobic bacteria can live practically on anything; minerals in the water, coolant concentrate, discarded food etc. These are also two of the most difficult to kill of all known bacteria, therefore, it is important to keep their growth in check.

⇨ Water quality is the number three failure mechanism of coolants.

There is another class of bacteria known as anaerobic which grow in the absence of oxygen. These grow much more slowly, dividing once every four hours and usually do not grow until the fluid has been attacked by the aerobic bacteria. One type of anaerobic bacteria produces a very strong odor of rotten eggs (Monday morning stink) and can cause severe dark staining on machines and work pieces. In the presence of iron it can turn the fluid black in color.

⇨ Aerating the coolant may retard the growth of anaerobic bacteria, however, it encourages the growth of aerobic bacteria.

How can these problems be overcome? The first is by selecting a quality product that is manufactured to withstand the stresses that machining or grinding will place on it. Second, follow the manufacturer's guidelines on concentrations and mixing. Third, practice good housekeeping.

For more information or assistance on maintaining your coolant system contact your Mau-Sherwood supply representative at (330) 405- 1200 or sales@mausherwood.com.