

Fungal Growth in Metal Working Fluids

Fungus and Mold

Molds, which are commonly referred to as fungus, are multicellular, filamentous organisms. They are typically composed of thousands of thread-like strands known as hyphae. These strands are typically identifiable under microscopic conditions.

Problems associated with fungi in metal working fluids tend to be difficult to alleviate in that these organisms are spore formers, meaning that they readily reproduce and can withstand harsh environments. If hyphae are disrupted and break off from the body of the organism, they may continue to grow independently. This cycle results in the propagation of new organisms.

Treatment of a Fungal Attack

Unlike bacteria, mold does not float freely and uniformly through a system. Instead, it tends to attach to surfaces. As a result, the problems associated with mold differ from those associated with bacteria.

Typical problems resulting from a mold outbreak include the plugging of filters and transfer lines, in addition to the generation of musty, “locker-room” like odors. It is also important to realize that a system is always vulnerable to attack, as inoculation occurs commonly via airborne organisms.

Treatment of a system under fungal attack requires physical removal of all visible masses in addition to a chemical treatment with a fungicide.

Summary

In order to best respond to a metalworking fluid system under fungal attack, you must first remove all visible signs of mold and then provide chemical treatment with a fungicide.

Some molds are known to cause human health effects, but to the best of our knowledge the molds associated with metalworking fluid systems have not been linked to human illness.

Appendix

Health Concerns Associated with Fungal Growth

Fortunately, fungal growth in metalworking fluids has not been shown to pose a health risk to humans. CINA is unaware of any reports in the scientific literature which link molds inhabiting metalworking fluid systems to human health effect endpoints.

The molds which commonly inhabit metalworking fluids are not unique to the industrial environment. They are common environmental organisms that can be found in air, in water, and/or in soil. As they enter a manufacturing system, the coolant provides an excellent source of nutrients which they may feed upon. The presence of these organisms are not known to cause any additional health risks to the machine operators. They are considered opportunistic pathogens, meaning that they should not pose a threat to a healthy individual, whose immune system is not compromised.

Although molds have not been associated with human health effects from growth in metalworking fluid systems, there certainly exist other circumstances in which molds are known to cause human illness. For example, molds are well known in the indoor air quality (IAQ) arena for causing human health effects when they are allowed to proliferate in HVAC (Heating, Ventilating, & Air Conditioning) duct systems. Sick building syndrome episodes have been related to mold spores causing sinusitis conditions or allergic respiratory responses in office workers. In addition, some molds associated with IAQ problems are known to produce mycotoxins, which can potentially cause health effects upon inhalation. A further example of a mold-induced health effect is the athlete's foot fungus that is common to public locker rooms.

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