

Summary of ILMA/SHERA White Paper

Hypersensitivity Pneumonitis: Is There an Association with Triazine Biocides and Mycobacteria in Metalworking Fluids?

Metalworking fluid (MWF) users have relied on triazine biocides for many years to maintain the quality of metalworking fluid mixes while in use. However, there has been talk lately about a possible association between triazines and mycobacteria and hypersensitivity pneumonitis (HP). What are the facts about this controversial subject? In 2003 the *Independent Lubricant Manufacturers Association* (ILMA) issued a publication (White Paper) on triazines and mycobacteria and HP to provide answers and guidance on this subject.

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Triazine biocides are approved (registered) by the *Environmental Protection Agency* for use in metalworking fluids. They are members of a larger class of antimicrobials commonly known as “formaldehyde-condensates.” Triazines are routinely formulated in water-based metalworking fluids, and they are also used tank-side as a means to reduce a broad range of microbial populations that cause spoilage of metalworking fluid mixes.

As a result of many years of proven usage, triazines have been shown to be highly effective chemical compounds that increase the useful life of fluids in a cost-effective manner. However, triazine-based and other formaldehyde-condensate antimicrobials have come into question, because of concerns by some companies about their ability to control microorganisms called mycobacteria. In this regard, there are assertions that certain species of mycobacteria, e.g., *M. chelonae* and *M. immunogenum*, cause HP – an allergic respiratory disease that has been found in a few workers in some metalworking facilities. Hypersensitivity pneumonitis is contracted through repeated inhalation of a wide variety of microbial or chemical agents (antigens) that are commonly found in domestic and occupational environments.

What is the connection between the newly discovered species of mycobacteria and triazines in metalworking fluids? The perception that triazine usage in MWF systems causes a proliferation of *M. chelonae* and *M. immunogenum* in fluids has not been subjected to rigorous scientific testing. Moreover, this perception does not explain situations where *M. immunogenum* and other mycobacterial species are present in fluid systems in relatively high concentrations (not unusual) but there are no cases of HP among exposed workers. Mycobacteria are sometimes found in MWF mixes, and natural and manmade water sources that we are all exposed to on a daily basis. Unfortunately, the banning of triazines in MWF concentrates to limit the growth of mycobacteria, as a means to prevent HP in workers, may be a hasty and ineffective attempt to respond to a problem that is not completely understood.

After a concerted study of the problem by the ILMA Safety, Health, Environmental Regulatory Affairs (SHERA) committee, the following statement was made in the White Paper:

*“The recent hypothesis which states that there is an association between the proliferation of *M. chelonae* and *M. immunogenum* in MWF systems and HP, as a result of triazine usage, has not been rigorously tested. This hypothesis becomes problematic in situations where *M. immunogenum* or other mycobacterial species are present in fluids - sometimes in relatively high concentrations - but there is not a single case of diagnosed HP in exposed workers. Therefore, until more scientific data are available, this hypothesis must be viewed with some skepticism.”*

We should not, however, take lightly the presence of mycobacteria or any other microorganisms in fluids. The White Paper recommends attention to the following measures:

- Proper engineering controls (ventilation, machine enclosures, etc.)
- Effective fluid management (including biocide usage)
- Industrial hygiene measures
- Facility housekeeping

Some EPA registered microbicides, e.g., isothiazolones and phenolic compounds, have been shown to be effective in treating metalworking fluids for mycobacteria.

SUGGESTED REFERENCES

- (1) Independent Lubricant Manufacturers Association. 2003. Hypersensitivity Pneumonitis: Is There an Association with Triazine Biocides and Mycobacteria in Metalworking Fluids? ILMA/Safety, Health, Environmental Regulatory Affairs, Committee, [Http://www.ilma.org/resources/white_paper_triazine_biocide.doc](http://www.ilma.org/resources/white_paper_triazine_biocide.doc).**
- (2) Wallace, R.J., Zhang, Y., Wilson, R.W., Mann, L., and Rossmore, H. 2002. Presence of a Single Genotype of the Newly Described Species *Mycobacterium immunogenum* in Industrial Metalworking Fluids Associated with Hypersensitivity Pneumonitis. *Applied Environmental Microbiology* 68(11):5580-5584.**
- (3) Falkinham, J.O. 2003. Mycobacterial Aerosols and Respiratory Disease. *Emerging Infectious Diseases* 9(7):763-767.**
- (4) Organization Resources Counselors, Inc. 2000. *Management of the Metal Removal Fluid Environment*. Washington, DC.**