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## Directions for Treatment of Water Systems Containing Legionella pneumophila with DOW Antimicrobial 8536

"Legionnaires' Disease" (legionellosis) is a pneumonia-like malady, getting name from the highly publicized outbreak at the 1976 American Legion convention in Philadelphia<sup>1</sup>. The U.S. Public Health Service Center for Disease Control (CDC) in Atlanta and other researchers have established that the disease is caused by a gram-negative bacterium that has been named Legionella pneumophila<sup>1,2,3</sup>. This organism has been isolated from dirt, ponds, streams, air, and from industrial and/or commercial water systems such as recirculating water cooling towers and evaporative condensers, which provide the opportunity for human contact on a daily basis<sup>2,4</sup>.

The exact route of human infection has not been determined. Occurrences of legionellosis have been demonstrated in buildings which have cooling towers or evaporative condensers as part of their air conditioning systems where L. pneumophila has been isolated from the cooling water<sup>2,4,5</sup>. However, the disease has also occurred in buildings and under other circumstances apparently unrelated to cooling towers<sup>2,4</sup>. Although cooling towers have not been linked positively to the transmission of the disease, and the degree to which L. pneumophila should be controlled to prevent its transmission to man has not been determined, it seems prudent to minimize the growth and development of this organism in water systems. Good housekeeping and water treatment practices, including the judicious application of effective biocides, will minimize the possibility of these systems serving as a route of transmission.

The CDC and other researchers have studied the susceptibility of L. pneumophila to biocides recommended for inhibiting biological growths in cooling and other water systems<sup>4,5</sup>. One of the compounds evaluated was 2,2-dibromo-3-nitrilopropionamide (DBNPA), the active ingredient in DOW Antimicrobial 8536. These laboratory studies demonstrated that the concentrations of DOW Antimicrobial 8536 used for the control of slime in industrial cooling water systems were

# Technical Information

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Technical Data

effective in controlling L. pneumophila within a reasonable treatment period. Therefore, based on these laboratory results, DOW Antimicrobial 8536 should reduce effectively the population of L. pneumophila that may be present in cooling water systems when applied according to the following schedule.

Since diverse physical, chemical, and biological conditions that may exist in operating cooling water systems can affect bactericidal action, it is recommended that the cooling water system be analyzed for the presence of L. pneumophila prior to and after treatment.

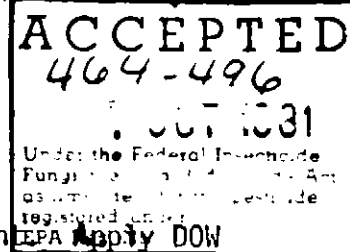
## Initial Dose

Apply DOW Antimicrobial 8536 as a slug dose at the rate of 3.34 lb to 5.0 lb (44.53 oz to 66.67 oz) per 1000 gal of water in the system or at a rate of 400 - 600 ppm based on the volume of the system. The cooling water should be checked for the presence of L. pneumophila at 3, 6, and 24 hr after treatment. If viable cells are found, the treatment should be repeated, preferably at the maximum allowable dosage rate. The system should be rechecked for presence of the organism at the intervals stated above. Repeat until control is achieved. After treatment, remove all deposits from the tower superstructure and from the sump.

## Subsequent Dose

The system should be kept clean after the initial treatment. Apply DOW Antimicrobial 8536 to the clean system intermittently or continuously at a rate of 0.80 lb to 3.94 lb (10.67 oz to 52.53 oz) per 1000 gal of water in the system, or a rate of 96 ppm to 472 ppm based on the volume of the system.

This treatment may not prevent reinfection of the system. To insure the absence of L. pneumophila, the system should be checked at appropriate intervals using an appropriate recovery technique for the organism<sup>2,4,5</sup>



References

1. Center for Disease Control (CDC). 1978. Legionnaires Disease: Diagnosis and Management. Ann. Intern. Med. 88: 363-365.
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3. Thornsberry, C., C. N. Baker, and L. A. Kirven. 1978. In-Vitro Activity of Antimicrobial Agents on Legionnaire's Disease Bacterium. Antimicrob. Agents Chemother. 13(1): 78:80.
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5. Skaliy, P., T. A. Thompson, G. W. Gorman, G. K. Morris, H. V. McEachern, and D. C. Mackel. 1980. Laboratory Studies of Disinfectants Against Legionella pneumophila. Appl. Environ. Microbiol. 40(4): 697-700.

