



# Product Data

173

July 15, 1984

Bulletin No. C66W

**ACCEPTED**

AUG 20 1984

Under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 1448-78

## Busan® 1005

(Patents issued or pending in the U.S.A. and other countries)

### Microbicide for Commercial and Industrial Water Systems

Busan 1005 is an industrial microbicide that is effective for the control of troublesome bacteria in commercial and industrial water systems. It is used in recirculating cooling water systems to control bacteria that cause fouling of the systems and to control other troublesome bacteria. It is also used to control slime-forming bacteria in holding ponds, reservoirs, and processing tanks of industrial water supply systems. However, Busan 1005 should *not* be used in drinking water or water that is to be used for food preparation.

In laboratory *in vitro* tests, Busan 1005 has demonstrated a high degree of effectiveness in inhibiting the growth of *Legionella pneumophila*, the Legionnaires Disease bacterium. Although it has not been demonstrated that this or any other microbicide will control *L. pneumophila* in commercial or industrial water systems, its use is recommended as part of any program to minimize the growth and development of fouling organisms in such systems. The total program should include good housekeeping, good water treatment practices, and regular microbiological examination of the water as well as proper application of Busan 1005.

Busan 1005 has a low toxicity to fish. Its 96-hour LC<sub>50</sub> is greater than 400 mg/L in rainbow trout and greater than 600 mg/L in bluegill sunfish.

The U.S. Environmental Protection Agency registration number for this product is EPA Registration No. 1448-78.

#### PACKAGING AND HANDLING

Busan 1005 is a completely water-soluble, nonflammable liquid packaged in nonreturnable drums with bungs. Materials of construction suitable for storing and handling the product include stainless steel, glass, polyethylene, polypropylene, poly(vinyl chloride), and most other plastics.

Busan 1005 is corrosive and causes eye damage. Therefore workers handling the product should wear safety goggles or face shield and rubber gloves, and work areas should have emergency eye fountains immediately available in case of eye contact. Busan 1005 has a low toxicity by ingestion in single doses and is only moderately irritating to the skin. Detailed precautionary statements and first aid instructions are provided on the drum label and on the Material Safety Data Sheet for this product.

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## Buckman Laboratories, Inc.

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### PRODUCT CHARACTERISTICS

The typical properties of the product are as follows:

Active ingredient:	
2-Hydroxypropyl methanethiolsulfonate .....	10%
Inert ingredients .....	90%
Density at 25 ° (77 °F) .....	1.02 g/mL
Approximate weight per gallon .....	8.5 lb
Approximate volume per kilogram .....	980 mL
Approximate volume per pound .....	440 mL
pH (100 parts per million in distilled water) .....	6-7

### METHODS OF APPLICATION

Busan 1005 can be fed into systems by means of chemical-metering pumps, or it can be dispensed in suitable measuring containers. The specific recommendations for applying this product will depend on conditions in each system, but the following are some general principles for its application. Technical assistance in the treatment of specific systems will be provided by Buckman Laboratories upon request.

#### Cooling Water Systems

Busan 1005 is used to control the growth of bacteria that cause fouling in heat exchangers, pipelines, cooling towers, and other parts of commercial and industrial recirculating cooling water systems. As a general rule, it is recommended that before treatment of a cooling water system with Busan 1005 is begun, the system should be cleaned thoroughly to remove all old microbiological slime and other deposits. The system then should be drained, flushed, and refilled with fresh water, and regular treatment with Busan 1005 should be initiated.

To treat recirculating systems, an initial slug addition of 19.5 to 80 mL of Busan 1005 per cubic metre of water (2.5 to 10.0 fluid ounces of Busan 1005 per 1000 gallons of water) to provide a concentration of 20 to 80 ppm Busan 1005 based on the total weight of water in the system is recommended. Repeat initial dosage until control is evident. Subsequent slug additions of 4 to 80 mL of Busan 1005 per cubic metre of water (0.5 to 10.0 fluid ounces of Busan 1005 per 1000 gallons of water) to provide a concentration of 4 to 80 ppm Busan 1005 should be made every 1 to 5 days, or as needed. The required frequency of addition will depend upon the relative amount of bleedoff and the severity of the bacterial problem.

#### Industrial Water Supply Systems

Busan 1005 is used to control the growth of slime-forming bacteria in holding ponds, reservoirs, and processing tanks of industrial water supply systems providing water to mill, factory, and other industrial processes. However, it should not be added to water intended for drinking or food preparation. In industrial water supply systems, Busan 1005 can be employed as a replacement for or as a supplement to the conventional treatment with chlorine or chlorine compounds. To control bacteria in such systems, Busan 1005 is added at 5 to 39 mL per cubic metre of water (0.5 to 5.0 fluid ounces of Busan 1005 per 1000 gallons of water) to provide a concentration of 4 to 40 ppm Busan 1005. Treatment is usually made continuously and should be based on the amount of water entering a pond or reservoir or leaving the pond or reservoir and entering the intermediate processing operations. In some cases, regular treatment periods of several hours each day will provide adequate control of the bacteria.

#### Water Systems Containing *Legionella pneumophila*

The U.S. Public Health Service Center for Disease Control (CDC) and other researchers have established that the so-called "Legionnaires Disease" or "legionellosis" is caused by a gram-negative bacterium that has been named *Legionella pneumophila*. Although this organism has been isolated from commercial and industrial water-cooling towers and evaporative condensers as well as from other sources, the exact route for the transmission of this pneumonia-like malady has not been definitely established. Cases of legionellosis have occurred in buildings where *L. pneumophila* was isolated from

the facility's cooling towers or evaporative condensers, but it has also occurred under circumstances that appeared unrelated to cooling towers. However, it seems advisable to minimize the growth of this organism in water systems.

The susceptibility of *L. pneumophila* to cooling tower microbicides has been studied in laboratory tests by several researchers, and the results have been reported in the literature. Similar laboratory tests have now been run with Busan 1005. These indicate that the active ingredient in this bactericide, 2-hydroxypropyl methanethiosulfonate (HPMTS), can inactivate pure cultures of *L. pneumophila* at a significantly lower concentration than that required for other commonly used cooling tower biocides.

While it has not been documented that Busan 1005 or any other cooling tower microbicide will eliminate *L. pneumophila* from a cooling system, it is recognized that minimizing slime growth and bacterial contamination is important. Treatment with Busan 1005 should be part of a total treatment program that includes good housekeeping, good water treatment practices, and regular microbiological examination of the water.

Recommendations given in this Bulletin are based on tests believed to be reliable. However, the use of the product is beyond the control of Buckman Laboratories, Inc., and no guarantee, expressed or implied, is made as to the effects of such or the results to be obtained if not used in accordance with directions or established safe practice. The user must assume all responsibility, including injury or damage, resulting from misuse of the product as such, or in combination with other materials. This Bulletin is not to be taken as a license to operate under or recommendation to infringe any patent.

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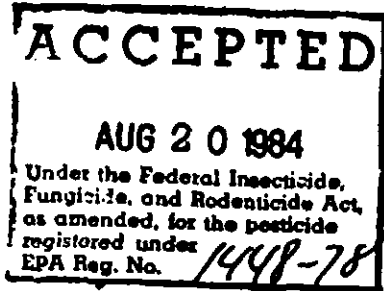
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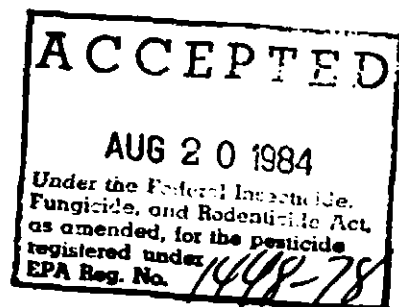
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