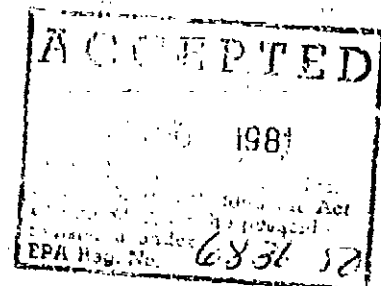
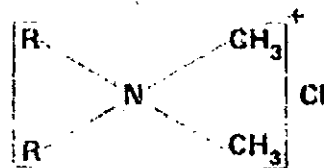


PRODUCT INFORMATION

**BARDAC® LF**  
**BARDAC® LF80**

Where R = n-dioctyl



Chemical Composition

Active Ingredients

Dioctyl dimethyl ammonium chloride  
Ethyl alcohol

**Bardac LF**      **LF80**

50%      80%  
10%      10%

Inert Ingredients

Water

40%      10%  
100%      100%

Physical Properties

Average Molecular Weight  
Specific Gravity  
Density

312      312  
0.93      0.897  
7.72 lb./gal.      7.48 lb./gal.

EPA Registration Number

6836-40      6836-50

CAS #

5538-94-3      5538-94-3

Application

Bardac LF/LF80 are designed for use as low-foaming microbiocides for use in recirculating cooling water systems, and low foaming swimming pool algaecides.

The presence of foam in recirculating cooling water systems greatly impairs the efficient performance of such units. Poor heat transfer and low pressures are two of the problems that have been attributed to foam. One of the possible causes of introducing foam into cooling units is the actual foam generation of the microbiocide used for algae and bacterial slime control. Bardac LF/LF80, by design, is a low-foaming microbiocide. Its use, at suggested use levels, will eliminate the incorporation of a potential foam producer into recirculating cooling water systems and effectively control the growth of algae and bacteria.

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### Laboratory Evaluations

To establish the basic antibacterial properties of Bardac LF-LF80, screening evaluations were performed utilizing Minimum Inhibitory Concentration Test Procedures (Broth Dilution Test, 18 hour immersion @ 37°C). The following result was obtained:

Test Organism	Minimum Inhibitory Concentration (ppm active Bardac LF/LF80)
Staphylococcus aureus, ATCC #4648	2.0
Escherichia coli, ATCC #11229	40.0

Additional tests were performed against the types of bacteria and algae commonly found in recirculating cooling water systems.

The API-38 Test Procedure (American Petroleum Institute Recommended Practice for Biological Analysis of Subsurface Injection Waters, Second Edition, Dec. 1965, Section II — Evaluation of Chemicals for Control of Microbial Growth, Sec. 25) was used for bacterial evaluations. This test procedure calls for a 96 hour incubation period (@30°C) for *B. cereus* and *Ps. fluorescens* and 30 days (@30°C) for *Desulfovibrio desulfuricans* (the sulfate reducing bacteria). The following results were obtained:

Test Organism	Minimum Inhibitory Concentration (ppm active Bardac LF/LF80)
<i>Pseudomonas fluorescens</i> , ATCC #13525	17.5
<i>Bacillus cereus</i> , ATCC #14579	7.5
<i>Desulfovibrio desulfuricans</i> , ATCC #7757	17.5

Algaecidal and algistatic determinations were performed using the Fitzgerald Method (Applied Microbiology, Vol. 7, 1959, pp 205-211). This procedure calls for incubation for 28 days (@23°C) under continuous light. The following results were obtained:

Test Organism	Concentration of Bardac LF/LF80 (ppm active) Required For	
	Stasis	Kill
<i>Chlorella pyrenoidosa</i> #2005 (Wisconsin Strain)	0.5	1.0
<i>Phormidium inundatum</i> #1093 (Black Algae)	0.5	1.25

### Field Evaluations

To confirm the effectiveness of Bardac LF-LF80 as low-foaming microbicides for use in cooling towers, field trials were performed. While tower conditions varied considerably from one to the other, effective microbial control was observed in all units.

The quantity of Bardac LF-LF80 required to effectively control microbial growth in cooling towers depends on a number of factors. Tower operating conditions, water quality and the severity of the microbiological problems are just three of the factors to be considered. Therefore, the optimum amount of Bardac LF-LF80 needed will have to be determined for each situation.

### **Field Evaluations (Cont'd.)**

The field trials performed did reveal that initial treatment of 60-100 ppm active and maintenance use-levels of 20-40 ppm (active) will produce the desired microbial control.

A sample label for a low foaming water treatment microbicide for recirculating cooling towers is attached. This guide may be followed in registering your product with the Environmental Protection Agency.

### **Low Foam Swimming Pool Algaecide**

Bardac LF-LF80 will keep pool water sparkling clear and free of algae and slime. Initial applications of Bardac LF-LF80 should be 2 ppm (active) to clean and clear the pool of algae. 0.5 ppm (active) will then maintain the pool.

A low foaming swimming pool algaecide can be produced by diluting one part Bardac LF with four parts water (one part Bardac LF80 with 7 parts water) yielding a 10% active solution.

A sample label for a low foaming swimming pool algaecide is attached. It may be used as a guide in registering your product with the Environmental Protection Agency.

The repacker or formulator of this product will be responsible for providing in-use data to support any claims they make against bacteria.

### **Handling Precautions for Bardac LF/LF80 Quaternary Concentrate**

**Flammable:** Keep away from heat and open flame.

**Danger:** Keep Out of Reach of Children. Corrosive. Causes severe eye and skin damage. Do not get in eyes, on skin, or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful or fatal if swallowed. Avoid contamination of food.

**First Aid:** In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. For eyes, call a physician. Remove and wash contaminated clothing before reuse.

If swallowed, drink promptly a large quantity of milk, egg whites, gelatin solution, or if these are not available, drink large quantities of water. Avoid alcohol. Call a physician immediately.

**Note to Physician:** Probable nature of damage: any contact dictate the use of gastric lavage. Measures against circulatory shock, respiratory depression, and convulsion may be needed.

This product is not to be used in drinking water. It should not be used in drinking water when it is not intended to be used in drinking water.