



# BIOFILM

Bacterial slimes, commonly referred to as biofilm, are gelatinous mats that resist the flow of water in distribution lines and through heat exchangers or condenser tubes. A biofilm consists of microbial cells and the extracellular material they produce. This slime is anchored securely to a surface and provides a protective environment.

Bacterial biofilm is normally of most concern in industrial cooling water systems, since they are normally responsible for fouling of chillers and heat exchanger. Algae biofilms will also foul distribution decks and tower fill and provide additional nutrients to support bacterial growth.

Microorganisms can be found in both the bulk water and on industrial water system surfaces. The bacteria can attach to the surfaces and are extremely difficult to remove.

## **Slime / Biofilm causes:**

- Reduction in heat transfer rates
- Fouling of the condenser
- Underdeposit corrosion and scale buildup
- Plugging of strainers and solenoid valves
- Fouling the filtration equipment

## **Biofilm bacteria can move in numerous ways:**

**Collectively, by rippling across the surface, or by detaching in clumps.  
Individually, through a "swarming or seeding" dispersal.**

## **MICROBIAL INDUCED CORROSION**

Another major problem is that biofilms may cause corrosion in the system (MIC). The biofilm sets up a difference in potential between one area and another. These differences will create anodic and cathodic areas which sets up a basic corrosion cell. Metal is lost at the anode and the electrons given up by the metal flow to the cathode to be consumed in a reduction reaction.

## **HOW DO YOU DESTROY BIOFILM??**

# **AGI recommends using TOWERKLEEN 142!**

1. Towerkleen 142 displays rapid biofilm removal and subsequent inhibition.
2. It is a combination of surfactants, penetrants, and chelants.
3. It will form reversible chelant complexes with the salts and inorganic ions which give structure to the biofilm.
4. Once the structure is destroyed the adhesive ability of the BIOFILM is destroyed as well.

## **DIRTY SYSTEM - USAGE RATE:**

80 oz. per 1000 gallons of system capacity  
(Added every day)

Note: A milk-shake brownish foam will form after about 30 minutes of addition.

## **MAINTENANCE DOSAGE RATE:**

80 oz. per 1000 gallons of system capacity  
(Added 1-3 times per week)

**\*\*\* CONTACT YOUR AGI DISTRIBUTOR FOR MORE INFORMATION \*\*\***