



# In Injection Molding Facility Sludge (Bio-organic deposit) Control

## Case Study

### Problem – Failure Rate

A Midwest plastic injection molding company had been treating their cooling tower water with good success over several years. Recently, the plant purchased a new packaged chiller to produce low temperature chill water for a specific mold application and used the existing cooling tower water to cool the condenser section.

After only a few weeks, the chiller efficiency dropped to the point that it could not maintain chill water temperature, and would fail due to high head pressure, attributed to surface fouling. The existing water treatment program failed to keep the surfaces clean of fouling. Chiller failure continued. The chiller issues caused significant production problems, including increased parts failure rate, product delays, and maintenance costs. In addition, chiller surfaces were significantly fouled as shown, and thus, production rate was further impacted.

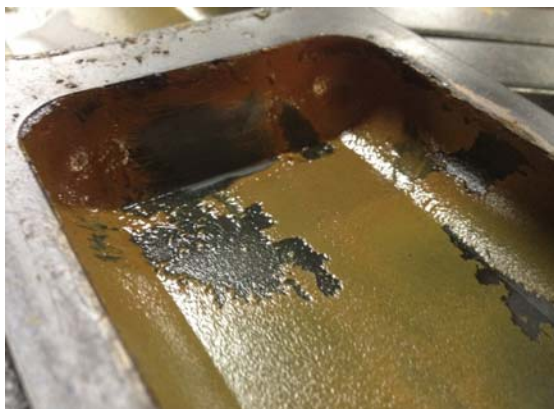


Image 1: Bio-organic deposition

### Cause of Problem - Biofouling

It was determined that the cause of fouling was related to a microbial produced coating (biofilm) on the heat exchange surfaces. Biofilm is created by bacteria so they can attach to surfaces, and reproduce more efficiently than if freely floating (planktonic). This “slime” (biofilm) prevents or limits biocides’ ability to kill the bacteria. A microscopic layer of slime reduces heat transfer rates which results in loss of process temperature control. By the time such layers are visible, the problem is very severe.

Although studies on the bulk water showed very few microorganisms present, it was clear that significant slime

remained on the heat transfer surfaces. The current biocide program was effective in the bulk water, **but was not effective in controlling surface fouling.**

### Solution - A successful Biofilm Control Program (BCP 1015 plus biocide)

Immediately after cleaning the condenser, BCP 1015, an effective penetrating agent, dispersant, and corrosion inhibitor, was used at dosage levels of 12 ppm (active) once per week. One hour after the addition of BCP 1015, the biocide was added (few ppm active).

Shortly after the addition of BCP 1015, a brownish foamy slurry developed. Slurry formation is related to the cleaning action and is proportional to the amount of deposits removed. Once the surface is clean, slurry formation stops.

BCP 1015, used on a consistent basis (maintenance mode vs cleanout mode), cleans surfaces and reduces the amount of biocide needed.



Image 2: BCP 1015-treated chiller surfaces free from bio-organic deposition

### Results

- Prior to the BCP 1015 program, the chiller could stay on line no more than about 7 weeks before shutdown and cleaning.
- **Using BCP 1015, there has been no downtime due to condenser fouling.** After several months, inspection showed the surface to be absolutely clean with no indication of organic deposits.



AMSA, Inc.®  
4714 S. Garfield Rd. • Auburn, Michigan, USA • 48611  
Tel: (989) 662-0377 Fax: (989) 662-6461  
sales@amsainc.com  
www.amsainc.com