



Detergent Manufacturing Facility – Injection Mold Cooling System - Bio-organic & Corrosion Deposit Control

Case Study

Problem – Plastic Bottle Mold Defects

A bottle manufacturing plant in Utah was experiencing high reject rates due to poor injection mold cooling. This resulted in high plastic recycle costs and the need to extend mold change times for extensive cleaning of the molds' cooling channels.

Cause of Problem - Biofouling

Poorly controlled microbial fouling throughout the chilled loop was determined to be the primary cause of accumulation of deposits whose composition was primarily biomass and corrosion products (iron and copper). Evidence of anaerobic under-deposit corrosion was seen in transfer piping, and water in the chiller's open indoor sump was very turbid. Mold cooling channel cleaning produced brownish black deposits which were a mixture of slime, corrosion products and other fine particulate matter.



Image 1: Deposits in the housing of the filter bag system.

Deposits which accumulate in the mold cooling channels limit cooling water flow, resulting in poor heat transfer and, ultimately, off-spec products.



Image 2: Aluminum alloy mold with a close-up of deposits in the cooling channel and pitting.

Solution - A Successful Biofilm Control Program (BCP™ 2430 Plus Biocide)

A water treatment service company experienced in the application of AMSA's BCP™ 1000 and BCP™ 2000-series products implemented a cleaning and deposit control program based on AMSA's BCP™ 2430, a highly effective low odor dispersant, known to be compatible with the system's formulated corrosion/scale inhibitor and isothiazoline-based biocide.

Results

After two weeks of the program, operators reported the following:

- Immediate improvement in chiller approach temperature (from 9.5 to 8.7 degrees within 2 hours, further reduced to 2.2 degrees after 36 hours)
- Improved microbial control, as shown by reduction in Total ATP from 300 – 350 to less than 30 RLU
- Removal of deposits from the system, evident in filter bag changes, and gradually cleaner filter bag housing
- Reduced generation of particulate suspended solids in the recirculating chilled water as indicated by decreasing turbidity of chilled water in the open indoor sump
- Decreasing amounts of deposits flushed from molds during changeovers
- Lower product reject rates and reduced costs associated with recycling off-spec product

