Algae Growth and Biofilm Control by Ultrasonic Technology

Authors: Vojtech Stejskal, Hana Skalova, Petr Kvapil, George Hutchinson

Abstract: Algae growth has been an important issue in water management of water plants, ponds and lakes, swimming pools, aquaculture & fish farms, gardens or golf courses for last decades. There are solutions based on chemical or biological principles. Apart of these traditional principles for inhibition of algae growth and biofilm production there are also physical methods which are very competitive compared to the traditional ones. Ultrasonic technology is one of these alternatives. Ultrasonic emitter is able to eliminate the biofilm which behaves as a host and attachment point for algae and is original reason for the algae growth. The ultrasound waves prevent majority of the bacteria in planktonic form becoming strongly attached sessile bacteria that creates welcoming layer for the biofilm production. Biofilm creation is very fast - in the serene water it takes between 30 minutes to 4 hours, depending on temperature and other parameters. Ultrasound device is not killing bacteria. Ultrasound waves are passing through bacteria, which retract as if they were in very turbulent water even though the water is visually completely serene. In these conditions, bacteria does not excrete the polysaccharide glue they use to attach to the surface of the pool or pond, where ultrasonic technology is used. Ultrasonic waves decrease the production of biofilm on the surfaces in the selected area. In case there are already at the start of the application of ultrasonic technology in a pond or basin clean inner surfaces, the biofilm production is almost absolutely inhibited. This paper talks about two different pilot applications - one in Czech Republic and second in United States of America, where the used ultrasonic technology (AlgaeControl) is coming from. On both sites, there was used Mezzo Ultrasonic Algae Control System with very positive results not only on biofilm production, but also algae growth in the surrounding area. Technology has been successfully tested in two different environments. The poster describes the differences and their influence on the efficiency of ultrasonic technology application. Conclusions and lessons learned can be possibly applied also on other sites within Europe or even further.

Keywords: algae growth, biofilm production, ultrasonic solution, ultrasound

Conference Title: ICWM 2018 : International Conference on Water Management
Conference Location: Lisbon, Portugal
Conference Dates: April 16-17, 2018