



## Milwaukee Art Museum, War Memorial, USA

Zebra mussel protection of intake structure for chiller water line and new heat exchanger system

## Background

The Milwaukee Art Museum, War Memorial is a strikingly beautiful building on the shores of Lake Michigan which needed to replace its 20 year old heat exchangers. Due to new construction and foot print limitations, the new chiller feed line was fed directly from Lake Michigan (part of the Great Lakes) and a filtration system was needed to prevent zebra mussels from entering the feed line and clogging the system.

## The Challenge

Zebra mussels were accidentally brought into the Great Lakes region many years ago, and they have become a threat to any intake system pulling water from the lakes. The larvae (veligers) are small and mobile and infiltrate intake piping and equipment. Once they reach a certain age, they will attach to a surface to feed on organics in the water and continue to grow and reproduce. This colonization can clog water intakes, condensers, exchangers, etc. Once a system is colonized, treatment is difficult. Mussels must be physically removed or treated with high temperature water or heavy doses of chemicals. The best solution is to prevent the veligers from entering the system in the first place. Filtration is an ideal solution for removing the veliger phases of the mussels, which range in size from approximately 80 to 400 micron.



## The Solution

4" Galaxy x10 x10, with stainless steel pods and manifolds, external source with a booster pump using filtered water. Flow rate: 1600gpm (363 m<sup>3</sup>/h) Filtration grade: 70 micron



## The Result

As can be seen from the photos below, the Arkal disc filter system has completely prevented any development of zebra mussels in the intake piping after the filtration system which has protected the chiller water line and heat exchanger.

Disc elements cleaned completely during inspection. Mussel development outside of filtration element only.

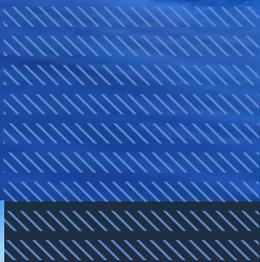


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