

## MIEX® Treatment VS GAC for TOC Removal

### Performance Impact & Life-Cycle Cost Considerations

When conventional coagulation and filtration treatment cannot remove enough total organic carbon (TOC) to maintain compliance with EPA disinfection byproduct (DBP) standards, one of two strategies can be implemented:

1. Pre-Treatment with MIEX or
2. Post-Treatment with GAC adsorbers

Both technologies are a proven means of reducing TOC levels to achieve DBP compliance; however, there are performance impacts and significant life-cycle cost differences to consider.

### Performance Impact Considerations

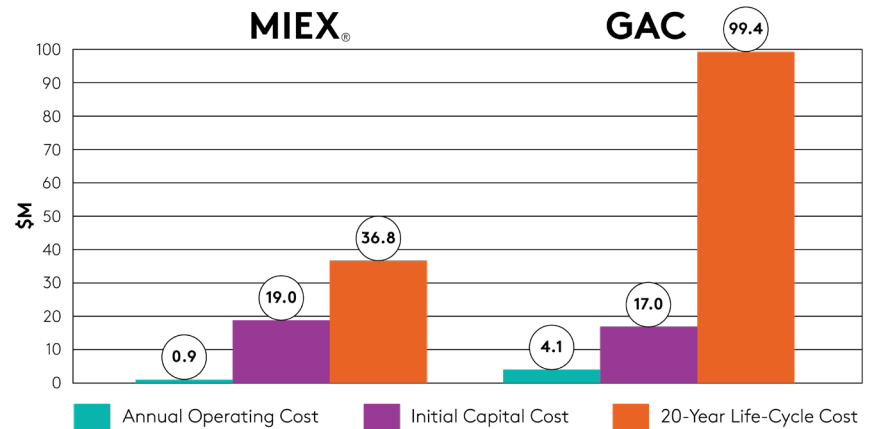
TOC removal with MIEX® Pre-Treatment provides a number of benefits for downstream treatment processes that are not realized with GAC Post-Treatment including:

- Reduction in coagulant dose and subsequent sludge volumes.
- Reduction in alkali use due to lower coagulant dose.
- Improved membrane performance due to reduced organic loading.

Post-filter GAC adsorbers used for TOC removal often need enhanced upstream coagulation to reduce TOC loading; otherwise, the GAC service life is reduced and operating costs increase. Overall, this practice results in increased costs in coagulant, alkali and sludge handling in addition to increased GAC replacement.

### MIEX® VS GAC Life-Cycle Cost Comparison

30 MGD WTP @ 20 MGD Avg Throughput @ \$1.75/lb GAC Cost



### Life-Cycle Cost Considerations

While GAC adsorbers are competitive with MIEX on initial capital cost, the MIEX life-cycle cost is significantly lower once long-term operating costs are factored in.

GAC operational costs are often prohibitive for TOC removal especially where the GAC system is required to remove more than 0.5 to 1.0 mg/L of TOC.

GAC can be reactivated but this is only feasible for very large water treatment plants due to the high capital costs of the reactivation system.

Also, this comparison does not take into account cost reductions for coagulant and sludge handling after MIEX Pre-Treatment which will further widen the life-cycle cost difference between MIEX and GAC treatment.

*GAC consumption data for lowering treated water TOC by 1 mg/L based on AWWARF Project #3075, "DBP Control in High Bromide Water While Using Free Chlorine During Disinfection," 2006.*

Contact us to learn how MIEX® can help you achieve better water.