

# Organic Contaminant Removal

## for Industrial Effluent Treatment Applications

### Organic Contaminant Removal

Cost-effective management of organic contaminants, such as biological oxygen demand (BOD) or chemical oxygen demand (COD), from effluents is one of the key challenges facing industries today. Depending on site operations, waste effluent may be discharged via a permit or reused on site, and in some cases organic contaminant removal will be required prior to discharge or reuse. Organic contaminants have a major impact on effluent quality and treatment process efficiencies by:

- Contributing to BOD and COD, which are typically regulated by discharge permits
- Influencing the appearance, color and odor of the effluent
- Acting as a food source for micro-organisms, resulting in bacterial growth in process equipment
- Interfering with the performance of activated carbon by competing with targeted compounds for active sites
- Reacting with coagulants causing slower, less effective flocculation and increasing coagulant demand
- Reacting with disinfectants, thus increasing chemical demand
- Reducing the capacity of membrane filtration by fouling

Traditional solutions for organic contaminant removal involve the application of complex treatment processes, requiring large capital outlays and significant operating costs. Orica Watercare's MIEX® Process offers industries a cost effective and environmentally friendly process.



Figure 1: Biologically treated pulp mill effluent (Left) & biologically treated effluent after MIEX® Treatment (Right)

### The MIEX® Solution

The MIEX® Process is an advanced magnetic ion exchange process that utilizes MIEX® Resin for removing anionic organic contaminants from effluent. The name MIEX® is derived from "Magnetic Ion EXchange," as the resin beads used in the process

contain a magnetic property that allows the beads to agglomerate and settle rapidly or fluidize at high

hydraulic loading rates. The resin beads used in this process are manufactured to be much smaller than conventional ion exchange resins, therefore providing 4-5 times the surface area of average ion exchange resins and allowing for rapid exchange kinetics. The MIEX® Process is applied in a continuous manner that results in minimal waste volumes and highly targeted treatment.

Using the MIEX® Process can significantly reduce the level of organic contaminants in industrial effluents by more than 80%, which is characterized as dissolved organic carbon (DOC) in the following table.

Table 1: Observed DOC reductions from various industrial effluents

Effluent Type	Raw Water DOC (mg/L)	MIEX® Treated DOC (mg/L)
Oxidized dairy condensate	5.8	< 1
Biologically treated pulp mill effluent	86.1	17.2
Ultra filtered paper mill effluent	70.5	23.2

### The MIEX® Process Delivers:

- Reliable treatment that is not subject to chromatographic peaking
- Minimal waste volumes, typically less than 1% of the total treated flow
- Minimal energy consumption
- Flexibility of placement in the treatment train
- Improved performance of downstream processes

### MIEX® Treatment Systems

MIEX® Treatment Systems are available as packaged systems up to 2 MGD (MAGNAPAK® Systems) and as custom-designed systems for all capacities over 2 MGD.

Orica Watercare can perform laboratory and pilot evaluations to determine the optimum performance of MIEX® Resin on effluent streams. Based on these feasibility studies, design packages and budget estimates can be provided.

### Contact Us

Contact your local Watercare office for details on your particular application.