

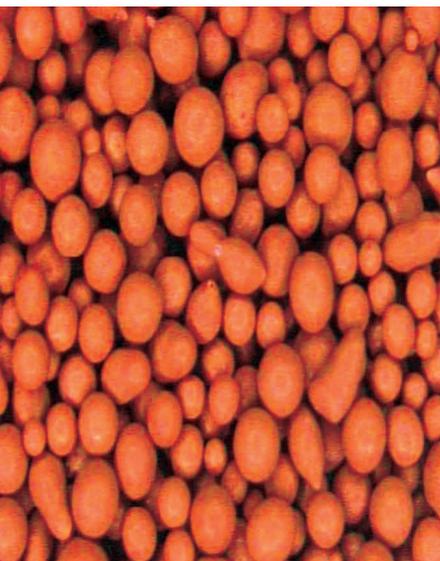


IXOM

MIEX[®] Treatment Systems

High Rate Configuration

Advanced ion exchange
treatment solutions



MIEX[®]

The MIEX® Treatment Process

The MIEX® Treatment Process is an advanced ion exchange process that uses MIEX® Resin to remove target contaminants from water and wastewater streams.

MIEX® Treatment Systems have small footprints, very low waste volumes and are not subject to chromatographic peaking, allowing ion exchange to be used in a wide variety of applications and throughputs.



Figure 1
Reactor Vessel

MIEX® Resin

The name MIEX® comes from “Magnetic Ion Exchange”. The resin beads have a magnetic property that allows them to agglomerate and settle rapidly, or fluidize at high hydraulic loading rates. Because of this unique feature, MIEX® Resin is used in a continuous process with ion exchange occurring in either a mixed tank or a fluidized bed reactor vessel.

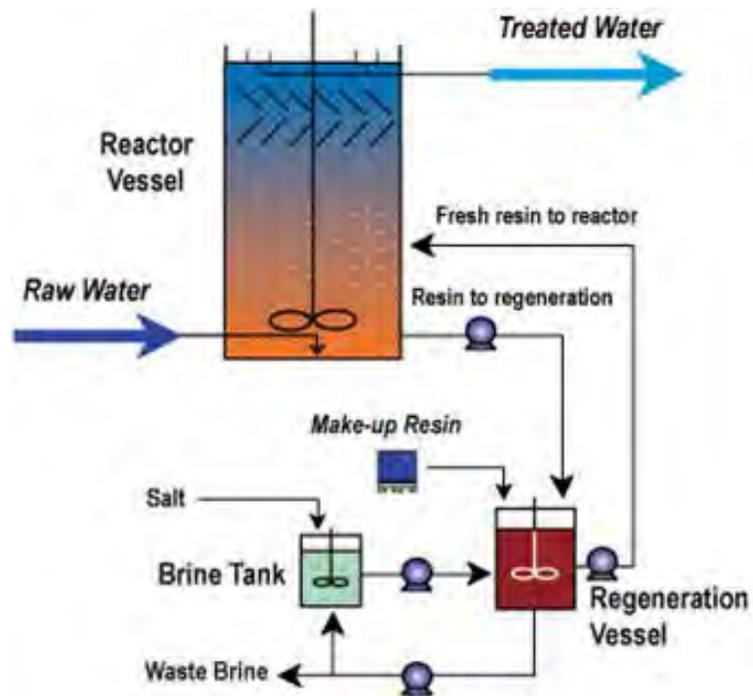


Figure 2
Process Flow Diagram

MIEX® Treatment System: High Rate Configuration

The High Rate configuration refers to a MIEX® System where ion exchange occurs in a fluidized bed reactor (Figure 2).

In this configuration, raw water is fed to the base of the reactor vessel and mixed with the MIEX® Resin. Within the fluidized bed, the magnetic resin beads are attracted to each other to produce large agglomerates that form a uniform resin suspension, allowing design hydraulic loading rates of at least 10 gpm/ft².

An agitator operating at low speeds maintains a uniformly mixed resin/water suspension. A small stream of resin is withdrawn from the reactor vessel, regenerated and returned to maintain the ion exchange capacity of the process.

A series of tube settlers (or plates) at the top of the reactor vessel separate the resin from the water. Treated effluent overflows into collection launders to downstream treatment.

Virgin resin is periodically added to the process to make up for minimal quantities of resin that may be carried downstream.

The High Rate configuration can be provided as an open tank gravity flow system or an enclosed pressurized system.

System Sizes

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.

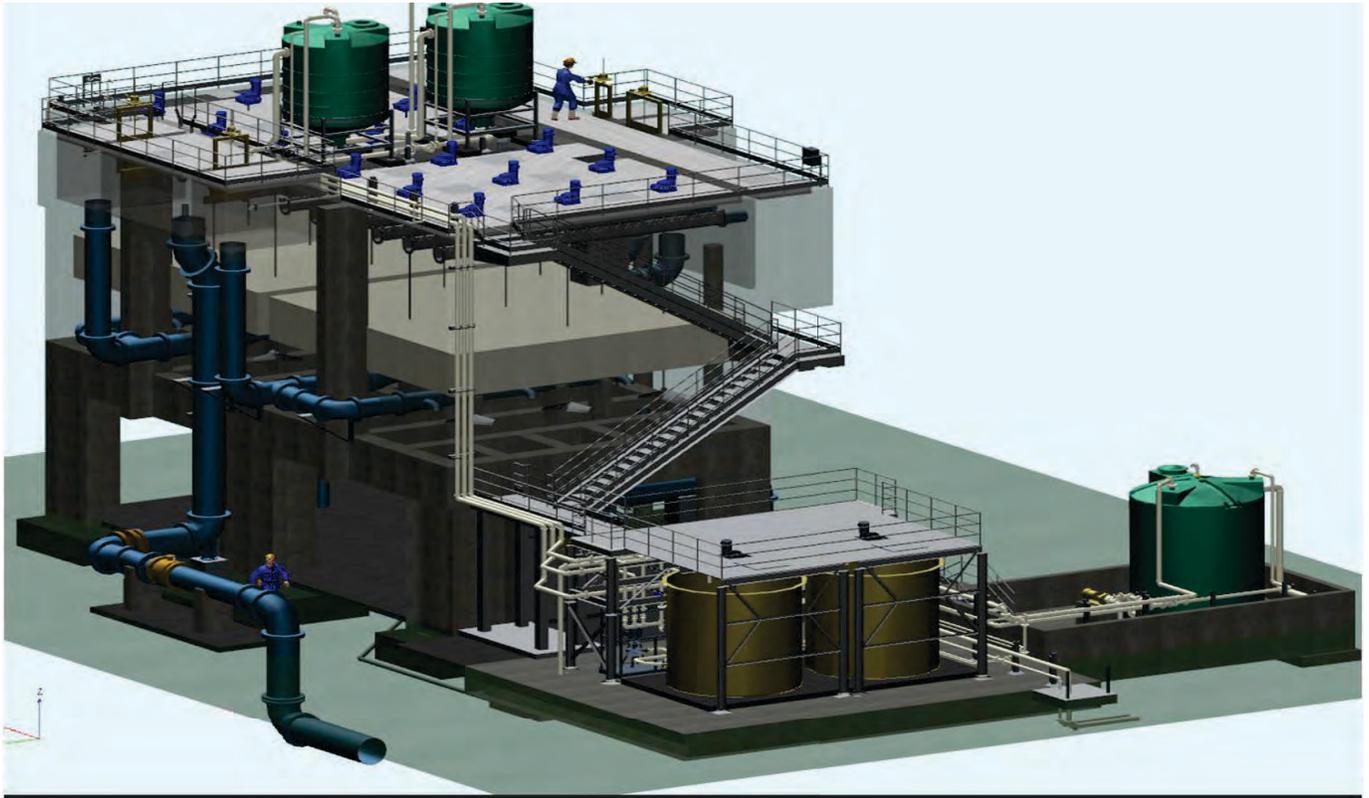


Figure 3
14.5 MGD MIEX® System

Resin Regeneration Process

The continuous withdrawal of loaded resin and return of fresh regenerated resin ensures a consistent treated water quality which prevents the chromatographic peaking that can occur with conventional ion exchange columns. Regenerant solutions typically consist of sodium chloride but other salts such as potassium chloride, magnesium chloride or sodium bicarbonate can be used if either sodium or chloride is not desired in the waste discharge.

Residuals

The highly efficient regeneration process keeps regenerant use and waste volumes to a minimum. Residual volumes from MIEX® Treatment Systems consist of waste from regeneration and are small, typically 0.02 to 0.06% of the plant throughput. Disposal options include sewer discharge, evaporation or coagulation/recycling of the regenerant solution.

Placement in treatment train

The MIEX® Process can be used as a stand-alone treatment for the removal of contaminants such as nitrate, arsenic or DOC, or in combination with other treatment processes to meet more than one objective.

Since the MIEX® Process is not affected by suspended solids in the source water, it can be placed in a number of locations throughout the treatment train. Typically it is used as a pretreatment step ahead of current processes. When used this way, the efficiency of downstream treatment processes can be greatly improved, resulting in less chemical demand and sludge production, better membrane operability, as well as improved solids separation through DAF and conventional sedimentation/filtration.

The addition of a MIEX® System requires little alteration, if any, to existing treatment systems.

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Ixom Watercare Services

Ixom performs laboratory and pilot evaluations to determine the optimum performance of MIEX[®] Resin on water and wastewater streams. A design package and budget estimate can be provided based on these feasibility studies. Ixom is also fully equipped to supply equipment and perform system commissioning and optimization upon installation.

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