DYNATEC SYSTEMS INC.
HI-RATE MEMBRANE BIOREACTOR SYSTEM
The Fast and Easy Way to Treat Your Waste Water
**Commercial Waste Stream**

- High quality effluent
- Minimize footprint with only membranes and chemical feed systems inside the building
- Direct and indirect reuse applications
- Saves costs with low space requirements and smaller leaching fields
- Efficiently removes high nitrogen and phosphorous concentrations
- Low maintenance and remote monitoring minimize operator attention

**Industrial Waste Stream**

- The **Hi-Rate MBR Wastewater Treatment System** provides a solution for high strength and highly variable waste loading in a full range of industrial applications
- High quality UF membranes have been applied in difficult industrial applications for many years
- Low space requirements
- Mesophillic and thermophillic processes
- Efficient step to high quality reuse

**Ideal for Retrofits**

- Increase plant capacity without increasing tank volume
- Add external membranes to an existing wastewater treatment system to produce higher quality effluent or increased capacity
- Solves operational issues of improper settling, high effluent solids and more stringent effluent requirements
- Provides the ability to produce water for reuse

**Continuous Crossflow Is the Key**

Turbulence and velocity keep the pores clean with a self scouring action.

**Permeate**

Treatment water passes continuously through the membrane. The filter blocks the contaminants, forming a positive barrier to bacteria and organics.
Dynatec Systems Hi-Rate MBR Treatment Systems
Bioreactor Tanks and Membrane Filtration Easily Treats Wastes

By combining over twenty years experience in applying membrane filtration and high rate biological treatment, Dynatec Systems has developed the **Hi-Rate MBR Wastewater Treatment System**.

This innovative system produces three to four times the flux of hollow fiber immersed membranes in a smaller footprint.

Higher flux rates means less membrane surface area required to treat the waste stream, which lowers capital and operations costs.

**Bioreactor Tanks**
- Biological agents (bacteria) break down organics into safe compounds of CO₂ and H₂O, minimizing sludge generation due to long SRTs and low F/M ratios.
- Blowers provide oxygen to bacteria to meet high uptake rates in high MLSS concentrations, minimizing tank volume compared to conventional treatment.
- Coarse bubble aeration provides easy commercial maintenance while jet aeration provides high efficiency aeration and mixing for power savings in industrial applications.

**Membrane Filters**
- UF membrane filters act as a physical barrier retaining solids and producing clear permeate that can be reused.
- Saves space by eliminating older style clarifiers which require more space.
- Returns biomass to the bioreactor tanks for additional efficient breakdown of organics.
- Tubular non-clog design reduces cleaning requirements.

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**Anoxic Tank**
- Removes nitrogen with biological agents.

**Bioreactor Tank**
- Breaks down organics with biological agents.

**Membrane Filters**
- Water passes through permeate; biomass returns as concentrate.

**Three Way Valve**
- During low loads, some permeate returns back to the bioreactor to maintain levels.

**UV Disinfection**
- Disinfects water with UV sterilization for discharge or recycling.

**High Quality Effluent**
- Ready for disposal or reuse/additional treatment.

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**Biomass Return**
- No extra pumps needed for nitrate recycle.

**Ultra-Concentrated Biomass Return**
- The biomass exists as a concentrate, sent back to the bioreactor tanks for reprocessing.

**Sludge Waste**
- Achieves lower sludge yields by operating at high MLSS levels.

**High Quality Effluent**
- The clear water permeate has no suspended solids. The effluent is discharged or forwarded for reuse or additional treatment.
Dynatec Systems Hi-Rate MBR Treatment Systems
The Fast & Easy Way to Treat Waste Water

When you need consistently high quality effluent, consider Dynatec Systems’ Hi-Rate MBR Wastewater Treatment Systems. You can lower your capital and operating costs with a single, compact system requiring minimal operator attention.

Greater Dependability
- Eliminates many of the unit processes associated with conventional treatment systems
- Membrane filters insure high quality effluent
- Eliminates filamentous bacteria and sludge bulking concerns
- Treats highly variable organic loads with ease

Better Performance
- Provides an absolute barrier between bacteria and the effluent
- Degrades constituents normally considered recalcitrant
- Eliminates solids carry over from occurring, allowing long sludge retention times
- Produces water free of bacterial contamination and suitable for reuse when additional disinfection is utilized
- Uses the membrane filters as a biomass separation process as well as a filter to meet low phosphorous limits with the supplemental addition of metal salts

Lower Costs
- Generates much less sludge due to operation at higher MLSS
- Exhibits the longest filter life and has the lowest replacement costs
- Requires a lower cost tankage — only 1/4 the size of conventional treatment tanks.
- Requires fewer system components and less space than conventional treatment systems.
- Features a modular system designed for easy installation and startup
- Consumes less chemicals than conventional treatments
- Eliminates diffusers when jet aeration system is specified
- Eliminates safety concerns of immersed membrane maintenance.

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