



WATER TREATMENT TECHNOLOGIES: ADVANCED AMBERPACK™ MUNICIPAL



WATER MANAGEMENT

- + SOURCING
- + WELL & PUMP MAINTENANCE
- + WATER TREATMENT TECHNOLOGIES
- + WATER RECYCLE & REUSE
- + WATER TRANSFER
- + WATER STORAGE

CONSTRUCTION

- + GEOTECHNICAL CONSTRUCTION
- + TREATMENT PLANT CONSTRUCTION
- + ALTERNATIVE DELIVERY
- + RENEWABLE ENERGY
- + SEWER SYSTEMS
- + TRENCHLESS REHABILITATION
- + WATER SUPPLY
- + WATER TRANSMISSION & DISTRIBUTION

DRILLING

- + EXPLORATION DRILLING
- + SPECIALTY DRILLING
- + WATER WELLS
- + BOREHOLE SERVICES

With continual emphasis on minimizing environmental impact, reducing treatment costs and waste residuals, the Advanced Amberpack (AAM) Municipal ion exchange process provides an innovative and commercially proven solution to nitrate removal.

Nitrate can be present in groundwater supplies from fertilizer and agricultural activity. The increased presence of nitrate is attributable to the 20-fold increase in the use of nitrogen fertilizers. The USEPA has set the nitrate MCL measured as nitrogen at 10 mg/l. Nitrate contamination is a concern as ingestion of nitrate in drinking water by infants can lead to oxygen deficiency in the blood, a potentially fatal condition.

EVALUATION OF TREATMENT EFFICIENCY

Understanding the full life-cycle costs of each treatment option is imperative for responsible investment. Layne understands the design, construction and operation costs of infrastructure and provides informed analysis of the costs and benefits of different solutions through pilot testing services.

LOW WASTE, HIGH EFFICIENCY, HIGH RATE ION EXCHANGE

Conventional ion exchange systems typically operate at surface loading rates of only 6-9 gpm/sf. Advanced Amberpack Municipal system is capable of being engineered for loading rates up to 25 gpm/sf. This enhancement allows for smaller vessels and lower vessel height, significantly reducing overall footprint requirements. The packed bed countercurrent ion exchange process incorporates a “state of the art” patented Fractal Distribution Technology that enables the treatment of large volumes of water, while producing minimal quantities of waste (typically in the range of 0.3-0.5% of the water produced for distribution).

REMOVAL OF NITRATE

For nitrate removal, Advanced Amberpack Municipal’s packed bed-countercurrent operation utilizes a nitrate-selective ion exchange resin and Fractal Distributors to eliminate contaminate spiking, while providing a near perfect separation of waste fraction from the regeneration process.

This makes Advanced Amberpack Municipal the best solution for contaminate removal to provide healthy water and keep industrial facilities, plants and government agencies running smoothly and cost-effectively.





ADVANCED AMBERPACK MUNICIPAL (CONT)

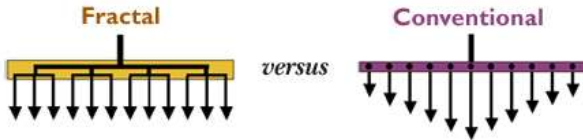
FRACTAL DISTRIBUTION TECHNOLOGY

Using a patented fractal distribution technique, an Advanced Amberpack Municipal system enhances the ion exchange process by equalizing distribution within the vessel for nearly perfect plug flow in column operations. The combination of this innovative distribution technology with other unique system components and operating parameters results in a truly revolutionary deionization system.

Fractal Cascade Distributor
prior to installation



The distance from the inlet point to each outlet orifice is constant, so there is no tendency for the water to prefer the path closer to the inlet. All holes have the same channel distance to the center.



WASTE REDUCTION

Waste reduction in the Advanced Amberpack system is a result of the Fractal Distribution technology. The columns below compare the waste diffusion profile in ion exchange systems with a conventional underdrain with that of the AAM Fractal Distributor.



Without Fractal

With Fractal

ADVANCED AMBERPACK ADVANTAGES

- + Higher loading rates enable smaller footprint
- + Vessel height is only 6 feet, saving overhead space requirement
- + Lowest overall capital cost, operating cost and cost of ownership.
- + High efficiency design
- + Low waste through selective brine reuse
- + Modular treatment train provides scalability
- + Reduced time and cost for field installation
- + Reduced regenerate costs
- + Standard fully automated design

TYPICAL SYSTEM FEATURES

- + Two or three vessel modular configurations
- + Modules are piped together for required capacity
- + Filter vessels, piping and valves, backwash supply
- + System controls shipped as integrated shop-assembled system
- + Automated PLC controlled regeneration and recycle system
- + All required flow instrumentation
- + Pressure gauges and sample points
- + NSF 61-compliant vessel lining
- + ASME Code Sect. VIII, Div. 1 pressure vessels
- + Fusion-bonded epoxy lined carbon steel (water) and Sch. 80 PVC (regenerate) piping
- + Finished painted vessels, piping and components
- + Galvanized support skid

OPTIONAL SYSTEM FEATURES

- + PVC piping system
- + Effluent monitor
- + Automatic finished water blending
- + NSF-compliant abrasion resistant vessel lining

Advanced Amberpack™ is a registered trademark of Rohm and Haas Corporation, a wholly owned subsidiary of Dow Chemical Company.

