



DynaSand **D2**[®]



Advanced Continuous Backwash Filtration System

Key Performance Advantage and Features

- Contaminant removal levels equivalent to low-pressure membrane
- Biological denitrification and polishing of municipal and industrial wastewater
- Super low phosphorus filtrate levels
- Water reuse
- Protection against waterborne disease

Why use the DynaSand D2[®] system

The DynaSand D2[®] advanced filtration system is a low-cost alternative to low-pressure membrane technology while producing comparable or superior filtrate quality. The D2 system removes contaminants to levels previously thought achievable only by low-pressure membranes. The USEPA, the New York State Department of Health and other third-party agencies have tested the D2 system and verified that this filtration process provides exceptional protection against waterborne diseases. In both pilot testing and full-scale installations, the D2 system consistently produces equivalent or better results than low pressure membrane technology. The D2 system is successfully installed in both water and wastewater plants ranging in size from less than 0.5 MGD to 25 MGD.

How the D2 System works

The patented DynaSand D2[®] process is based on a modular design to accommodate a variety of installation and site requirements. Each module consists of two continuously self-cleaning DynaSand[®] filters in series. The DynaSand[®] filter is a proven, reliable component with thousands of installations and over 30 years of operating history. Each DynaSand[®] filter is designed

to serve a different function within the process. The first stage filter uses larger sand grain size to give it more solids-handling capacity, and employs a proprietary DynaSand[®] process known as Continuous Contact Filtration, or CCF. In the CCF process, coagulation, flocculation and separation take place within the filter bed and produce a very high quality filtrate. Effective separation within the DynaSand[®] Filter is achieved at a much smaller floc size and, based on the application, can reduce chemical usage up to 30%. The second unit acts as a polishing filter, utilizing smaller sand size and providing higher removal efficiencies. The third component of the DynaSand D2[®] system is a Lamella[®] Gravity Settler, which treats reject from both filter stages. Average reject effluent volume is 0.5% of the feed flow.

The D2 system is available as above ground stainless steel package units or, for larger flows, multiple 50 square foot modules are installed in concrete tanks. The internals are shipped in easy-to-assemble sections and field assembled. Advanced SCADA controls are normally supplied as part of the system design. Superior results and consistent performance are the trademark of the DynaSand D2[®] process. Lower capital and operating costs make it an attractive, economical alternative to low-pressure membrane technology.



D2 installation



ENR controls



Inside a DynaSand D2[®] filter

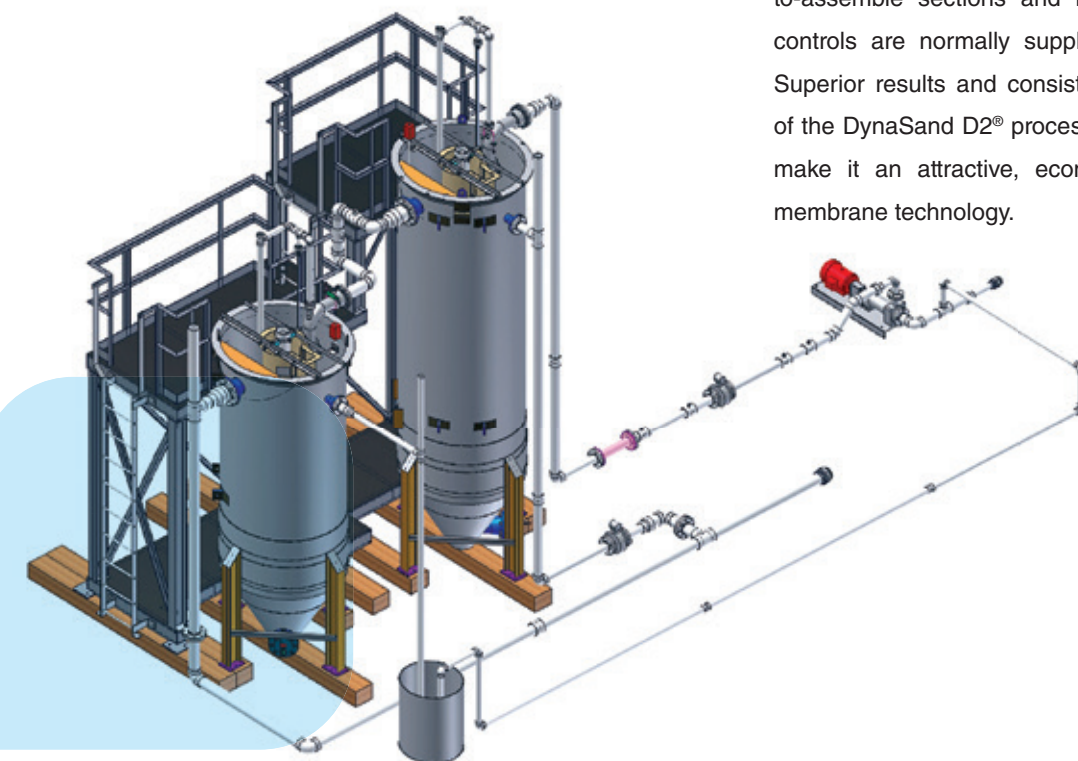
Key Performance Advantages

- Superior total phosphorus removal - as low as 0.01 mg/L
- Potable water NTU less than 0.05
- Membrane pretreatment SDI less than 3*
- Combined N and P removal
- Metals removal - Fe, Mn, Al
- T.O.C. removal below DPBR limits
- Algae removal
- 7 Log removal of Giardia and Cryptosporidium
- Meets 10 states standards for surface water filtration

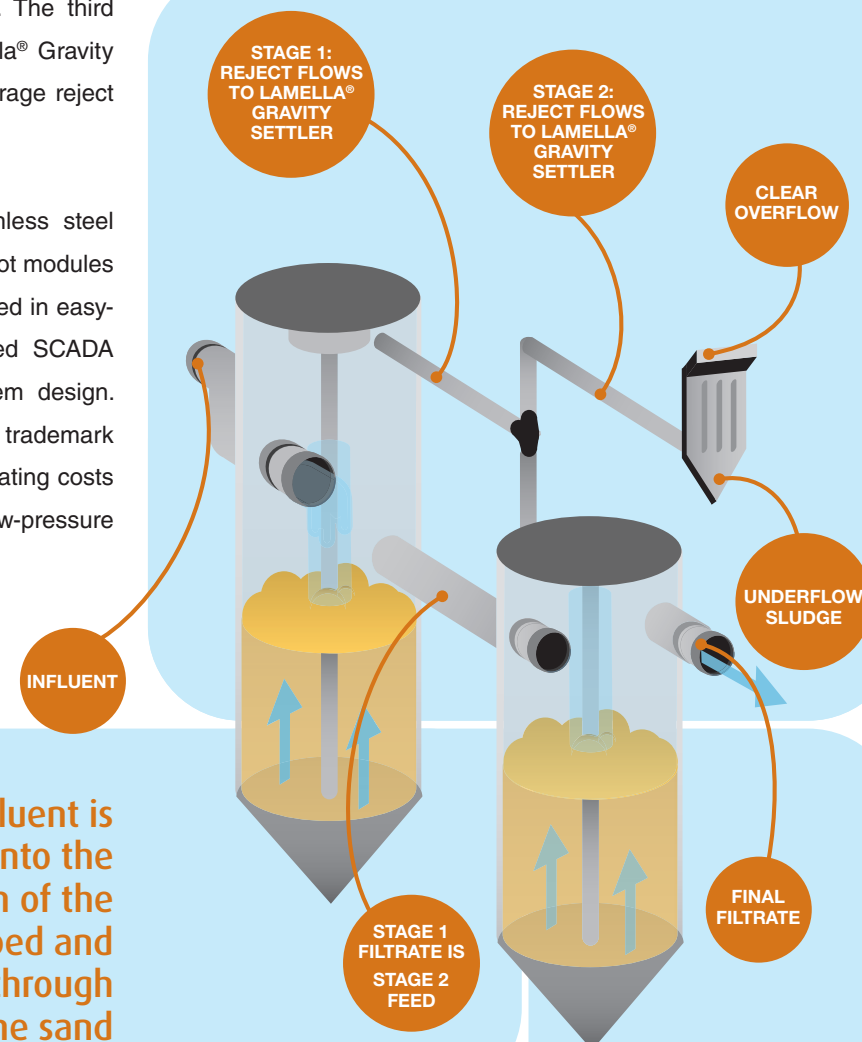
* SDI < 3 after required downstream cartridge filter. SDI of <5 out of filter bed.

Key Operational Benefits

- High solids capacity
- No moving parts
- Low pressure drop
- Continuously cleaned sand bed
- Single media
- Elimination of ancillary equipment
- Even flow distribution with multiple units
- Low operating and maintenance costs
- Cost effective to install
- Fraction of the cost of low pressure membranes
- Average reject effluent of 0.5%
- Extremely low power consumption



Influent is released into the bottom of the sand bed and flows up through the sand



Typical D2 Wastewater Filtrate Quality

- Turbidity 0.05 - 0.1 NTU
- 0.01 - 0.05 mg/L Total P
- 1-3 mg/L Total N
- BOD <3 mg/L
- 7 Log removal Cryptosporidium and Giardia

Typical Potable Water Filtrate Quality

- Turbidity <0.05 NTU (0.03 - 0.05 NTU)
- Color <5 TCU (1-2 TCU)
- 7 Log removal Cryptosporidium and Giardia
- TOC <2 mg/L (reduce potential for downstream THM production)

USEPA and NYCDEP/NYSDOH 1998 comparison of DynaSand D2[®] system with (MF) microfiltration

Parameter	MF	DynaSand D2 [®] System
Net Water Production	90%	95%
Backwash	6-16%	0.5%
Downtime	10%	0.1%
Coagulant Dosage	0.75-2.6 gpd	3 gpd
Turbidity	<0.1	<0.1
BOD/TSS	<1	<1
"P" Reduction	68%	96%
Crypto Removal	6.47 Log	7 Log
Electrical	80 amps	10 amps
Maintenance	Factory trained	Plant personnel on-site

Applications for the DynaSand D2[®] Advanced Filtration System include:

- Municipal drinking water and wastewater
- A broad range of industrial applications including boiler feed and cooling water
- Wastewater recycle and reuse
- High quality pre-filtration for membrane processes and desalination
- Enhanced nutrient removal (ENR)



The Parkson Pilot Program

Mobile pilot units are available to demonstrate the DynaSand D2[®] system's ability to process site-specific source waters. The pilot units are equipped with full monitoring and reporting capabilities and demonstrate the ease of operation of the DynaSand D2[®] advanced filtration system.



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