

BioGill Ultra



A Plug & Play Biological Wastewater Treatment System

The BioGill Ultra is an attached-growth bioreactor for secondary wastewater treatment. The largest bioreactor in the BioGill product range, the Ultra is a compact design ideal for facilities seeking a simple, robust and highly efficient biological treatment system or to boost capacity of an existing treatment process. BioGill bioreactors are simple to install and easy to operate, with minimal maintenance requirements and low lifecycle costs.

At the core of the BioGill Ultra is patented Nano-ceramic media, known as Gills. The unique design of the Gills provides the ideal habitat for microorganisms to rapidly establish into a robust biomass.

AIR SIDE & WATER SIDE

Oxygen diffuses within the biomass from the air side to the liquid side. At the same time, nutrients diffuse through the biomass from the liquid side to the air side. The process is known as counter diffusion and works 4 to 5 times faster than oxygen diffusion. This means BioGill systems can be online, achieving treatment goals within days after start-up or system restart.

The BioGill media fosters a biomass that is remarkably tolerant of fluctuations in wastewater flow and organic (BOD & COD) loadings. This is a key benefit for facilities with variations in wastewater-producing activities over the course of the week or throughout the year, making the bioreactors equally well suited to year-round or seasonal use.

REDUCED CARBON FOOTPRINT

As the Ultra is passively-aerated with natural convection moving air from vents located at the bottom through to vents at the top, there is no need for energy intensive blowers or aeration as used in conventional technologies. This delivers significant savings in energy and operating costs and a reduced carbon emissions footprint.

A plug & play solution, the Ultra is quick to install, and the modular design makes it easier to scale up and add more units when wastewater volumes increase.

BioGill Benefits



Meet compliance & discharge limits



Boost performance of existing plants



Resilient to shock loads & flow fluctuations



Save on surcharges



Reduce odor



Compact footprint modular & scalable

Key Features

- Control system includes PLC, HMI and extra control connections
- Recirculation pumps with VFD
- Sloped floor in the recirculation tank for easier sludge removal
- Feed water flow monitoring & control, ensuring consistent flow
- Separate hydraulic skid
- Two stage unit
- Patented, non-clog HydroSwirl™ water dispersal system
- Safety rail and ladder (optional)

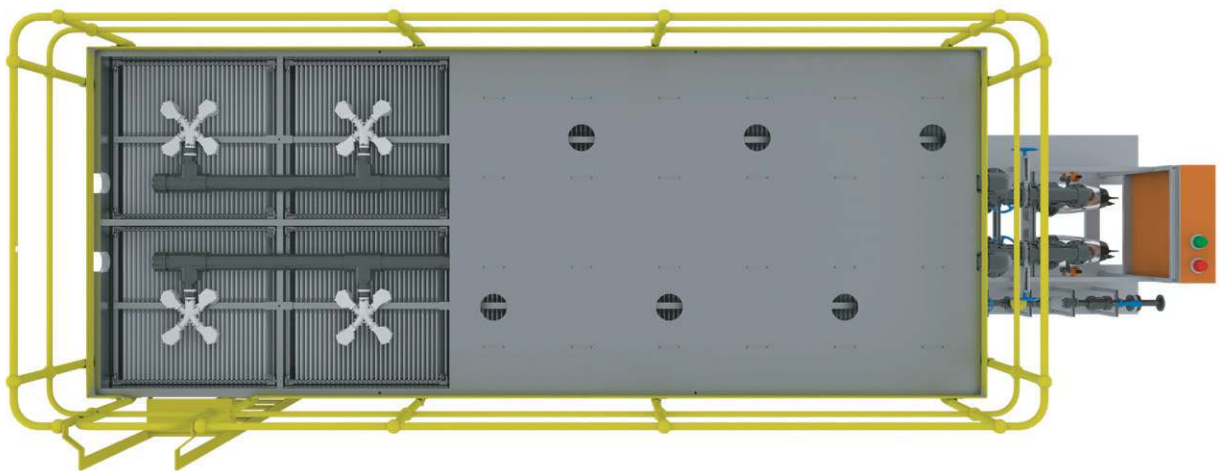
Key Benefits

- Simple to operate
- Low sludge yield
- Low energy consumption
- Modular/expandable
- Tolerance to high organic loading and FOG
- Tolerance to fluctuations in flow & load
- Rapid biological start-up & restart time
- Quick installation
- Easy to operate with minimal operator input
- Simultaneous aerobic & anaerobic treatment
- Low lifecycle costs

Configurations

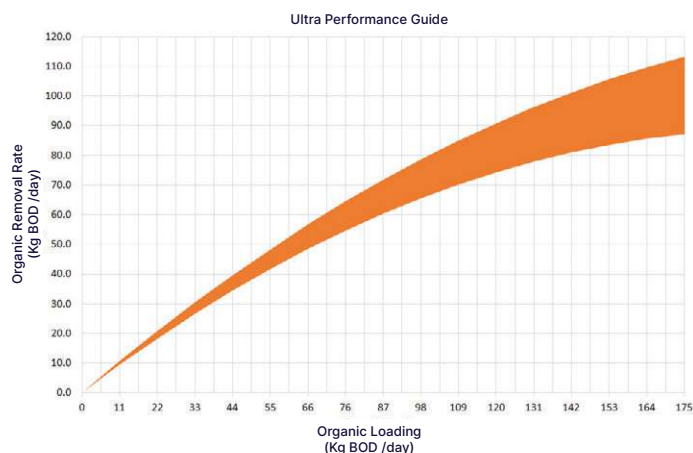
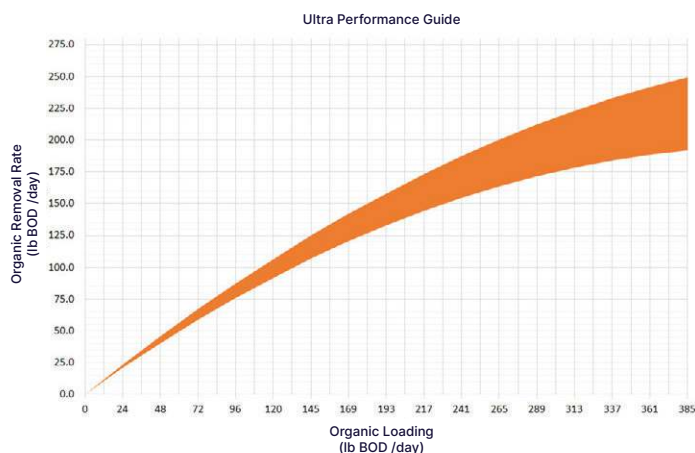
The BioGill Ultra comes complete with a container housing ten internal treatment cartridges, a recirculation tank, pumps and control panel. The design is both compact and flexible, allowing for a variety of installation configurations, such as side by side, stacked or placing the recirculation tank underground. The control system also allows for easy addition of ancillary equipment and simple integration into an existing wastewater treatment process.

Side view (with 6 external walls removed)



Top view (with 8 access hatches removed)

Performance Guide | BioGill Ultra



These performance graphs are to be used as a sizing guide only. Actual performance is determined by site specific factors and may vary. The above information is based on the following; a continuous flow system; brewery wastewater and water temperature at 86°F | 30°C. Removal rates and reductions are based on soluble BOD only. BioGill and its authorized representatives do not guarantee performance unless stated otherwise. For detailed system sizing or for information on projects outside these influent parameters, please contact your authorized BioGill representative.

Technical Specifications

		Value (Imperial)	Value (Metric)	
OPERATING & DESIGN INFORMATION		Temperature	65-100F	18-37C
		pH Range	6.5-8.5	
		Optimum C:N:P Ratio	100:10:1 to 100:5:0.5	
		Required Pre-treatment**	Influent TSS <300 mg/L Maximum FOG <100 mg/L	
		Recirculation flow rate per Cartridge	18-44 gpm	4-10m3/hr
NOMINAL DIMENSIONS & WEIGHT	BIOREACTOR ONLY	Gill Surface Area	23,520ft ²	2,185m ²
		Minimum Height Clearance (Approx.)	6'-6¾"	2,000mm
		Length	18'-8¼"	5,695mm
		Width	7'-2¼"	2,190mm
		Height	7'-3½"	2,220mm
		Footprint	140ft	13m ²
		Dry Weight	11,795 lbs	5,350 kg
	Wet Weight (Max. Load Approx.)	34,285 lbs	15,550 kg	
	ULTRA (COMPLETE PACKAGE)	Length	26'-2½"	7,987mm
		Width	8'-7½"	2,631mm
		Height	14'-6"	4,420mm
		Footprint	226ft	21m ²
		Recirculation Tank Capacity	5,020gals	19m ³
		Dry Weight	20,065 lbs	9,100 kg
Wet Weight (Max Load Approx.)		84,660 lbs	38,400 kg	
ULTRA CONNECTIONS	Inlet Connection	6" Flange	150mm Flange	
	Outlet Connection	6" Flange	150mm Flange	
	Recirculation Pump Connection	6" Flange	150mm Flange	
	Inter-Unit Recirculation Connection	6" Flange	150mm Flange	
	Drain Connection	2" Flange	50mm Flange	

*Consult your authorized BioGill representative for information about specific applications. **General recommendation - can vary depending on influent composition.

How BioGill Works

Biological wastewater treatment relies on microorganisms to consume organics in the wastewater. Like all living things, microorganisms need the right habitat to flourish. BioGill above ground bioreactors use patented Nano-ceramic media, known as Gills, to provide the ultimate air and liquid interface for the microorganisms to grow, multiply and thrive. Arranged in suspended vertical loops, each Gill is folded over a support, creating two distinct sides: one in contact with the water and the other in contact with the air.

By providing the perfect habitat, the microbes perform at their best, protected in the biofilm and effectively removing pollutants from the wastewater. BioGill solves many of the shortfalls of other technologies by delivering effective treatment of high organic waste streams, Fat, Oil and Grease (FOG), as well as reducing odor.

Step 1 Wastewater is pumped to the top of the BioGill bioreactor.

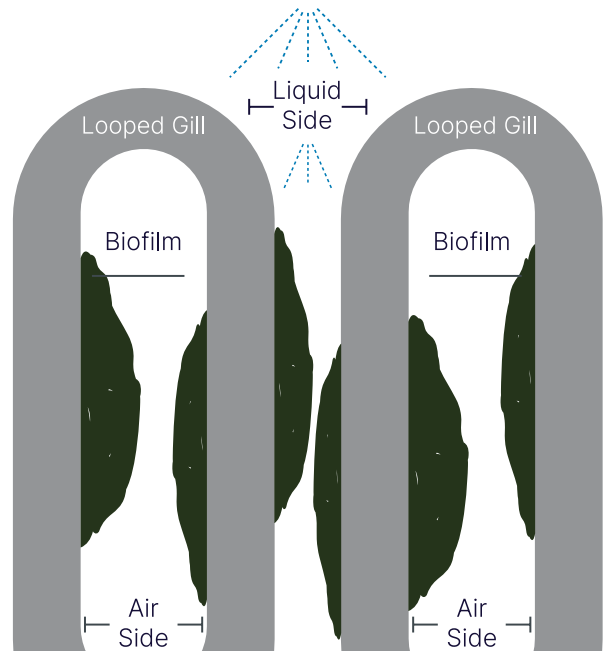
Step 2 The wastewater is then dispersed over the looped Gills and gravity fed down through the unit.

Step 3 Biomass self-optimizes, growing the most suitable microbes to feed on a given wastewater. The result is a robust biomass that is more resilient to shock loads, FOG and high organic wastewaters.

Step 4 Natural air convection, resulting from the heat generated by the biomass, creates a continuous supply of oxygen.

Step 5 Treated wastewater exits the BioGill system with reduced levels of BOD, COD and FOG.

Fig 1. Gill structure



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Case studies and technical reports are available at www.biogill.com

