

## BioAir DS External MBR concept - A more reliable treatment with comparable economical performance to submersible MBR

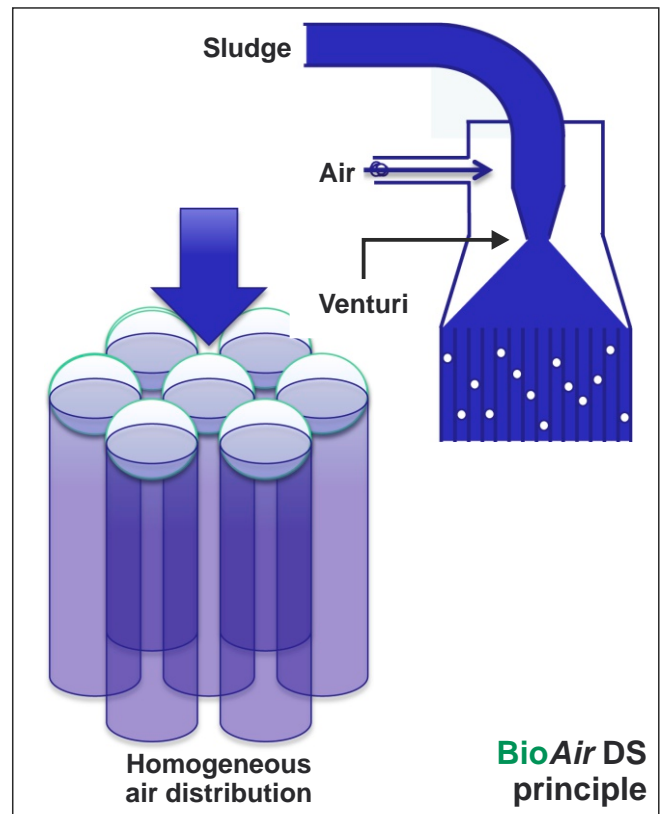
The External BioAir DS (Down Stream) MBR concept of Berghof is especially developed for treatment of municipal wastewater and other less complex and concentrated wastewater applications.

The Berghof BioAir DS principle features the creation of maximum turbulence into vertically mounted HyperFlux-I8LE modules by using the innovative DS air distributor.

The DS air distributor guarantees an optimized air/water mixture into each individual membrane which ensures fouling control at any time

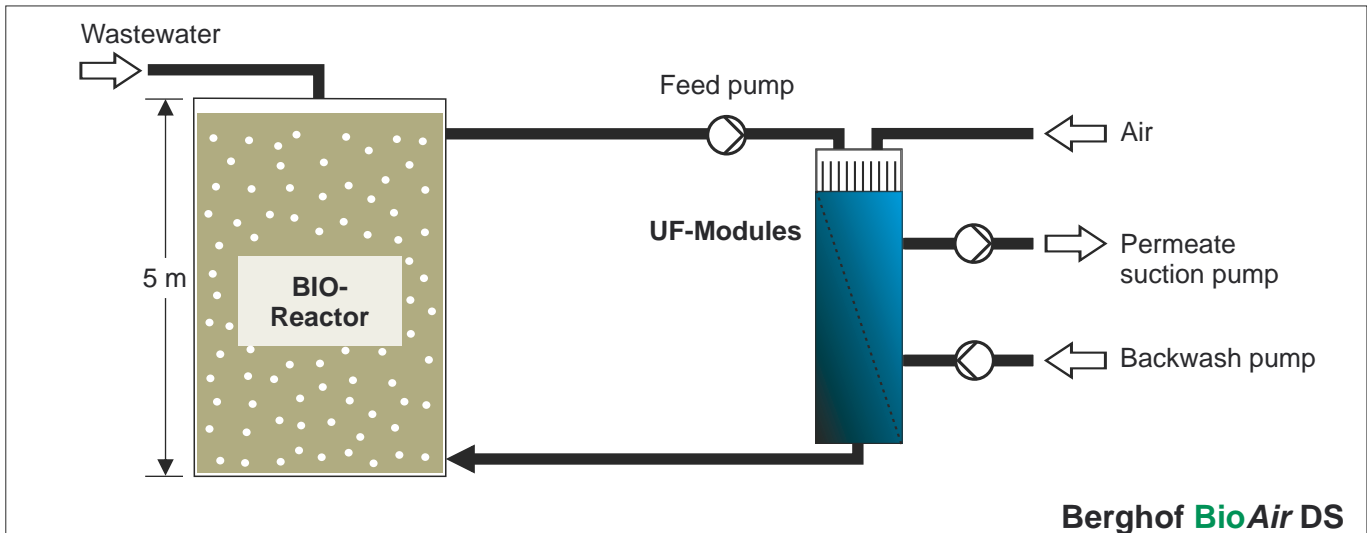
### ■ Innovative DS air distributor

The BioAir DS MBR concept is equipped with the Berghof HyperFlux-I8LE module program. Today the 10-inch 4m modules guarantees a compact, efficient and economical treatment for large scale MBR wastewater treatment plants. Through the revolutionary DS air distributor, positioned on top of each module, air is injected simultaneously into each individual membrane tube at a fixed and precise rate.



### ■ Advantages

- Backwashable I8 LE tubular membranes
- DS air distributor controls fouling in each individual membrane
- Low plugging risk
- High flux rates
- Economical design with 104U module
- Very competitive to submerged
- Low operating pressure
- Energy saving due to low pressure air injection  
- 100% reuse of UF Down Stream air to bioreactor
- Low chemical cleaning and maintenance requirements
- Robust design
- High efficient air scouring for cleaning and biodegradation



### ■ Process principle

Mixed liquor is pumped from the bioreactor at a reduced flow to the top of vertically mounted HyperFlux 10-inch 4m modules (alternative 3m length). Through the revolutionary DS air distributor, positioned on top of each 10-inch module, air is injected into each individual membrane at a fixed and precise rate and controls fouling at any time. The scouring mixture discharges from the bottom of the module is returned to the bioreactor. The innovative DS air distribution has led to a further reduction of the power consumption due to optimized feed/air flow. The MBR system operates on a continuous basis. The permeate pump controls the permeate flow rate. An automatic backwash program is periodically removing the fouling layer on the membrane surface. A maintenance cleaning can be expected to be required every 4 - 12 weeks.

Type BioAir DS Skid		DS 10/10_I8 XL	DS 20/10_I8 XL	DS 40/10_I8 XL
Mixed liquor MLSS	g/l	8 – 12		
Module type		MO 104U 66.03 I8 LE XL		
Membrane type		66.03 I8 LE		
Number of modules skid	max	10	20	40
Membrane area (max)	m <sup>2</sup>	534	1068	2136
Trans membrane pressure	bar	0.2 - 0.4		
Energy consumption	kWh/m <sup>3</sup>	0.2 - 0.5		
Feedflow capacity (at 0.1 – 0.7 bar)	m <sup>3</sup> /h	192 – 480	384 – 960	768 – 1.920
Average Airflow capacity (at 0,2 bar)	Nm <sup>3</sup> /h	50	100	200
Permeate flux	l/m <sup>2</sup> .h	30 – 60		
Permeate capacity	m <sup>3</sup> /h	16 - 32	32 - 64	64 - 128
Skid dimensions	l*w*h	2.5m*0.9m*5.1m	5.9m*0.9m*5.1m	13.1m*0.9m*5.1m

Alternative UF skid with 3m modules type BioAir DS 40/10\_I8

