

AquaBeads

Suspended Biofilm Carriers

Aquabead Suspended Biofilm Carriers, along with the SCBR process, provide an innovative advancement to biological wastewater treatment plants.

The SCBR or Suspended Carrier Biofilm Reactor process incorporates a multitude of AquaBEAD® carriers which are loaded into a bioreactor and circulated by aeration or mixing currents. The uniquely designed AquaBEAD® profile affords an enormous protected surface area for attached biofilm growth and this large surface area-to-volume ratio allows reduced process tank sizing and increased substance removal rates.

AquaBEADs® can be used in new wastewater treatment plants or can be easily retrofitted to existing plants with minimal alterations, with a resultant increase in operational performance and system stability.

Key features

- ↻ Compact reactor tank design – tank volume requirements may be reduced by up to 80%, saving construction and transport costs.
- ↻ Robust biofilm process – high resistance to shock loads or temporary TOC and nutrient depletion.
- ↻ Easy upgrading of existing plants – increased capacity may allow major plant upgrades to be delayed.
- ↻ Easy to operate and control – operation is similar to conventional treatment processes.
- ↻ High BOD/COD and nitrogen removal performance can be used in both aerobic and anaerobic processes.
- ↻ Exceptionally long sludge ages are possible – allows time for specialized bacteria to colonise and breakdown difficult-to-remove substances.
- ↻ No biomass washout during heavy loads – safe reliable operation.
- ↻ Highly efficient removal of soluble organic and nitrogen loads.
- ↻ Utilizes the entire reactor volume – better performance than fixed film processes which are affected by aeration and turbulence shadow zones.

Aquabead® SCBR Process Description

AquaBEAD® suspended biofilm carriers are manufactured using a mineral filled polyethylene with a density slightly heavier than water. The

biofilm carriers are kept in suspension and in continuous movement by turbulence from the aeration or mechanical mixing.

As the carriers pass through the turbulent aeration plume, shearing forces slough excess biomass to maintain an optimum biofilm thickness on the carrier surfaces for efficient oxygen utilization.

The AquaBEAD® carriers are retained within the bioreactor by a simple sieved outlet screen.

Due to continuous movement of the carriers, the system is not prone to clogging and does not need to be backwashed. The process is self-cleaning and requires no special maintenance.

AquaBEAD® suspended carriers can be utilized in various system configurations including pre-treatment or roughing reactors, single pass reactors for BOD/COD removal and activated sludge systems for nitrogen and phosphorus removal.



Aquabead® SCBR process allows flexible design options

SIMPLE AQUABEAD® SCBR PROCESS

- ↻ Compact and simple plant design
- ↻ Single or dual tank design with no return sludge circulation
- ↻ Ideal for BOD/COD removal
- ↻ Nitrification and denitrification can be achieved within the same tank

AQUABEAD® SCBR COMBINED WITH ACTIVATED SLUDGE PROCESS

- ↻ Provides a compact, efficient & high performance plant
- ↻ Single tank or dual stage tanks designs for high nitrogen and phosphorous removal

- Can be added to existing activated sludge plants to upgrade performance
- Suitable for a variety of wastewater types including: municipal, breweries, paper & pulp and food & dairy
- Ideal for Aquaculture recirculating systems

AQUABEAD® SCBR COMBINED WITH MEMBRANE BIOREACTOR SYSTEM

- Allows a compact plant design with a small footprint area
- Allows exceptionally long sludge ages for specialised bacteria to form
- Class A effluent for water reuse applications

AQUABEAD® SCBR USED AS A ROUGHING REACTOR

- Typically used as a pre-treatment process to reduce BOD/COD loading prior to a conventional activated sludge plant
- Protects nitrifying bacteria from shock due to toxic loads
- Can be used to extend the operational life of an outgrown conventional activated sludge plant



AquaBEAD® specifications

Type	> AB03-2*
Dimensions	> 810mm x 7mm
Density	> 1.05g/cm ³
Material	> Mineral filled polyethylene
Total surface area	> 860m ² /m ³
Protected surface area	> 560m ² /m ³
Protected surface area @ 66% fill**	> 375m ² /m ³
BOD ₅ oxidation rate	> 6700g BOD ₅ /m ³ .d (@15°C, ±80% removal)
Oxygen transfer rate	> 9.0g O ₂ /Nm ³ .m
Nitrification	> 445g NH ₄ -N/m ³ .d (@15°C)
Denitrification	> 750g NO _x -N/m ³ .d (@15°C)

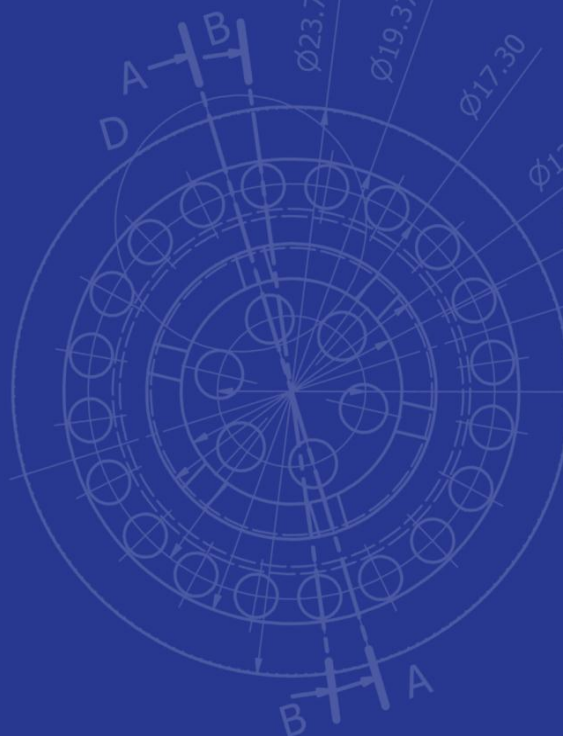
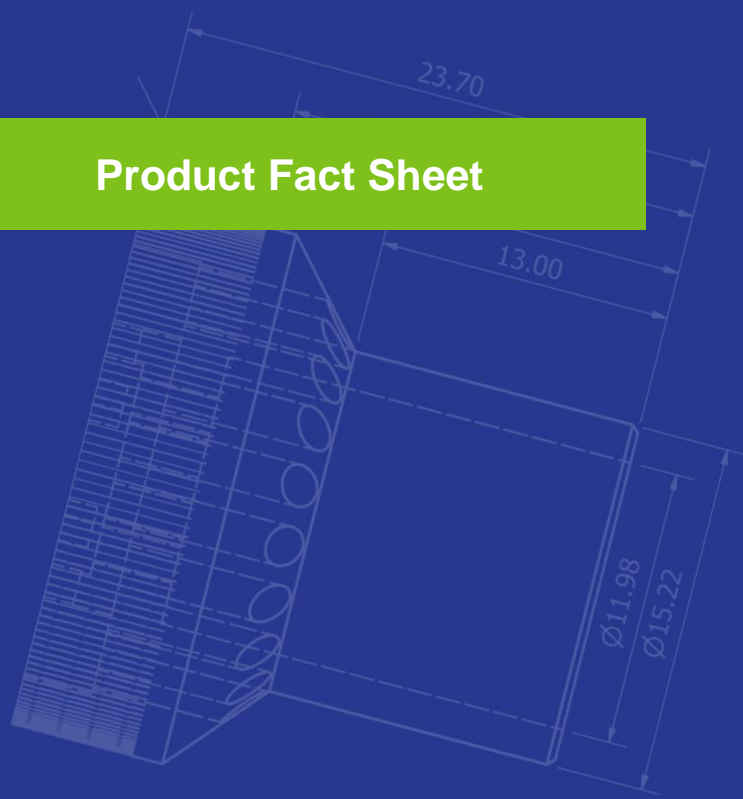
* Other AquaBEAD® carrier types are available for special applications, e.g. where fibrous matter is present.

** Fill volume is typically between 33% and 66% (maximum) of reactor volume.

Contact MBR Technologies for design application information.



Product Fact Sheet



Syngineering Water Pty Ltd
Ph: 1300 662 326
E: info@syngineering.com.au
W: www.syngineering-water.com.au