What Is AFM?

AFM is an activated filtration media designed to replace filter grade sand in pressure filters and gravity flow filters. It is far superior to good quality silica sand. AFM is manufactured and activated from reprocessed glass.

The electron micro graphs of sand and AFM clearly shows that sand has 100% bacteria coverage after 3 days in a drinking water filter whereas AFM stays free of biofouling, even after 5 years in sewage effluent. A high level of bacteria reduces the filter performance by 30 – 50% therefore, increasing the chemical demand.

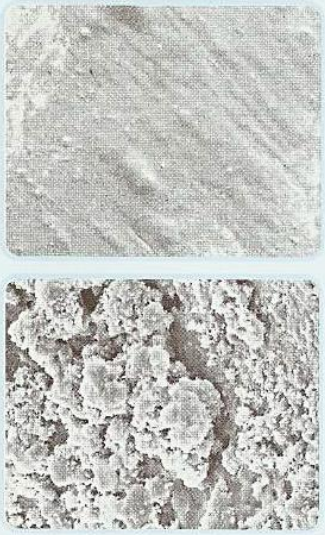

Figure 1
AFM (up) and sand (down) photographs after five years in a swimming pool pressure filter, 50µm scale

Why Choose AFM?

Sand acts as a bacteria incubator and increases bacteria levels in water. In RGF (rapid gravity filter) and pressure filters, biofouling of sand reduces performance. The extracellular alginate excreted by bacteria causes wormholes through the sand bed and coagulation of sand. AFM resists biofouling and stays clean, therefore reducing bacterial levels.

How It Works?

- AFM physically removes particles from water and is superior to a high quality silica sand.
- AFM is a self-sterilizing media that has a hydrophilic surface with a –ve (negative) Zeta potential that adsorbs micron, sub-micron, organic molecules, and heavy metals.
- Catalytically cracks organics, oxidizes heavy metals and actively prevents biofouling.

Figure 2
AFM (up) and sand (down) photographs before use in a filtration system, 50 µm scale

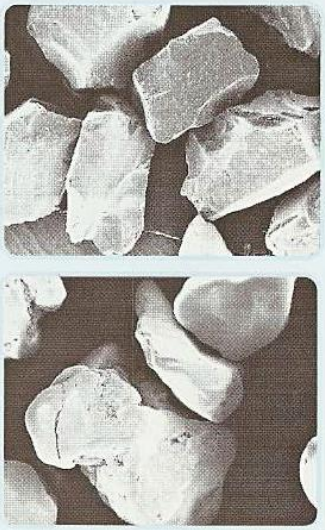

Figure 3
AFM (up) and sand (down) grains

Not just a replacement for sand, but a whole new system

Applications

- Pre-treatment prior to RO membranes
- Cooling towers and boiler feed water
- Industrial water and waste water
- Tertiary treatment of sewage effluent
- Drinking water/potable water
- Irrigation
- Swimming pools
- Water recovery system

Advantages

- Improves water clarity and quality.
- Able to achieve 5 microns filtration rate compared to equivalent grade of sand at 10 microns and removes cryprosporidia.
- Surface permanent –ve charge removes small particles, organic modules, and +ve ions such as iron and manganese.
- Less likely to become contaminated by fats, lipids, and biological growth.
- Easy to back-wash. In drinking water and clean water applications, 30 – 50% more solids are back-washed from AFM.
- Performance of AFM is maintained because back-flush efficiency is 100%.
- Lower pressure drop, with predictable and stable filter performance.
- Chemically inert and without free silica.
- Less coagulant and chlorine needed.
- Reduces energy consumption and maintenance requirement.

Recommended Water Flux

- Potable water : 5 – 10 $m^3/m^2.hr$
- Swimming pools : 10 – 15 $m^3/m^2.hr$
- Rivers & sea water : 10 – 15 $m^3/m^2.hr$
- Industrial effluent : 5 – 10 $m^3/m^2.hr$
- Landfill leachate : 3 – 6 $m^3/m^2.hr$
- Tertiary WWT polishing : 3 – 6 $m^3/m^2.hr$

How to use

- Direct replacement for sand in all pressure or gravity flow sand filters by replacing existing sand with AFM. In all applications and flow rates tested, AFM out-performed sand.
- The filter should be layered with Grade 2 AFM as the bottom layer (20 – 30% of total volume). Grade 1 is placed on top of Grade 2.
- For very high performance, Grade 0 (~10% of total bed volume) may be used on top of Grade 1
- No changes in filter design or operating procedures.

Specifications

- Appearance : Similar to sand
- Bulk Density : 1450kg/m^3
- Chemical Composition:

SiO_2	: 74%
Na_2O	: 11%
CaO	: 10%
MgO	: 3%
Al_2O_3	: 1%

- Standard Particle Size:

Grade 0	: 0.25 – 0.50 mm
Grade 1	: 0.50 – 1.00 mm
Grade 2	: 1.00 – 2.00 mm