



Water solutions for the world.

# Water Filtration

A GUIDE ON USES FOR  
THE OV AFM FILTER

## E BOOK



# WELCOME

# INTRODUCTION



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The heart of our water filtration systems is the OV AFM media filter. Filtering to 0.45 microns, this media filter is unlike others in the market, and optimizes the filtration capabilities for the media used. It is in use in multiple situations filtering potable water, wastewater and even removing oil from water. Able to be combined with other equipment to provide a full range of filtration options, this filter is very versatile. The information contained in this document is to assist you in understanding the capabilities of this product and how it may be of use to your filtration needs



solar

# OV AFM FILTER

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Iron filtered from water using OV AFM Filter

## APPLICATIONS

- Municipal Water Supply
- Aquaculture
- Municipal Wastewater Treatment
- Industrial Wastewater
- Process Water
- Swimming Pools
- Marine Parks
- Hospital Bio-fouling Reduction
- Environmental Protection
- Reverse Osmosis Protection
- Borehole Iron, Manganese and other Mineral Removal
- Canal Water Filtration
- River Water and River Cleanup
- Sea water pre-RO
- Cooling Towers
- Heating/Cooling Systems
- Leachate Treatment
- Removal of Light Oil
- Coal Seam Gas Water

The Solari OV AFM Filter is an Optimised Media Filter that has been in successful operation for a number of years with hundreds of sales around the world in Europe, South Africa, China, Australia, and the USA.

The filter continues to capitalize on the benefits of the patented Activated Filter Media (AFM) from Dryden Aqua. This optimisation improves the performance considerably above the already impressive results achieved in water filtration with AFM.

It comfortably outperforms the results from high quality sand filtration media, glass beads of various types and other media. Performance tests are verified by IFTS, a well recognised international testing entity.





Filtering Water at a Spirulina Greenhouse Complex

## USES & BENEFITS

### OVERLOAD OF NITROGEN & PHOSPHORUS

#### Uses of the filter

The OV AFM Filtration System is mainly used to filter suspended solids from water between 0.45-200 microns at >92% efficiency.

The capacity is 3-5 times of a same sized sand filter.

The maximum solids load is 200mg/L.

The AFM media used in the filter has a lifespan of the filter, without replacement. It can be applied in Industrial Wastewater, Domestic Wastewater, Water Supply Plants, Cooling Towers, River Water, Side Stream Filtration, Pre-treatment of RO, Oilfield Wastewater, and other water situations that need to have suspended solids or light oil removed.

## IN A CLASS OF ITS OWN:

There are no other low energy filtration machines that achieve the quality of tertiary filtration polishing of water to the same efficiency 96-97%, or to such a fine degree of 0.45 micron without flocculants.

Pre-membrane filtration levels < SDI 5 have been achieved in the field. This means the green footprint is considerably lower.

When combined with a Zeta Potential Mixer (ZPM <https://solarewater.com.au/zpm-filters/>) and flocculation, materials as fine as 0.01µm can be removed.

Subject to causation, Chemical Oxidation Demand (COD), Biological Oxidation Demand (BOD) and Suspended Solids are reduced to levels below Drinking Water Standards instantly in Continuous Flow Systems.

Total Dissolved Solids also reduce noticeably through a process of particularization thereby reducing the loading on Reverse Osmosis equipment.



# Unique Benefits

## OPTOMISED VELOCITY HEAD.

Allows control in inflow velocity within the vessel, despite changes in inflow rates, resulting in optimisation of the water media interface by creating up to 300 times the surface area of media for contact with water. Positioning eliminates potential for biological buildup in any dead zone within the vessel.

## AFM MEDIA.

Significant advance in efficiency and cost reduction of media over the life of the vessel with effective filtration of <0.45 micron at >92% efficiency on a continuous basis with no potential for bio-fouling or wormhole channeling.

## FOOT PRINT.

Small footprint means higher filtered water volumes over others. Results in much less space requirements.

## BACKWASH COLLECTOR.

Minimizes potential for media loss whilst acting like a vacuum for waste removal. Reduces backwash loss of process water by 95%.

## DIFFUSER DESIGN.

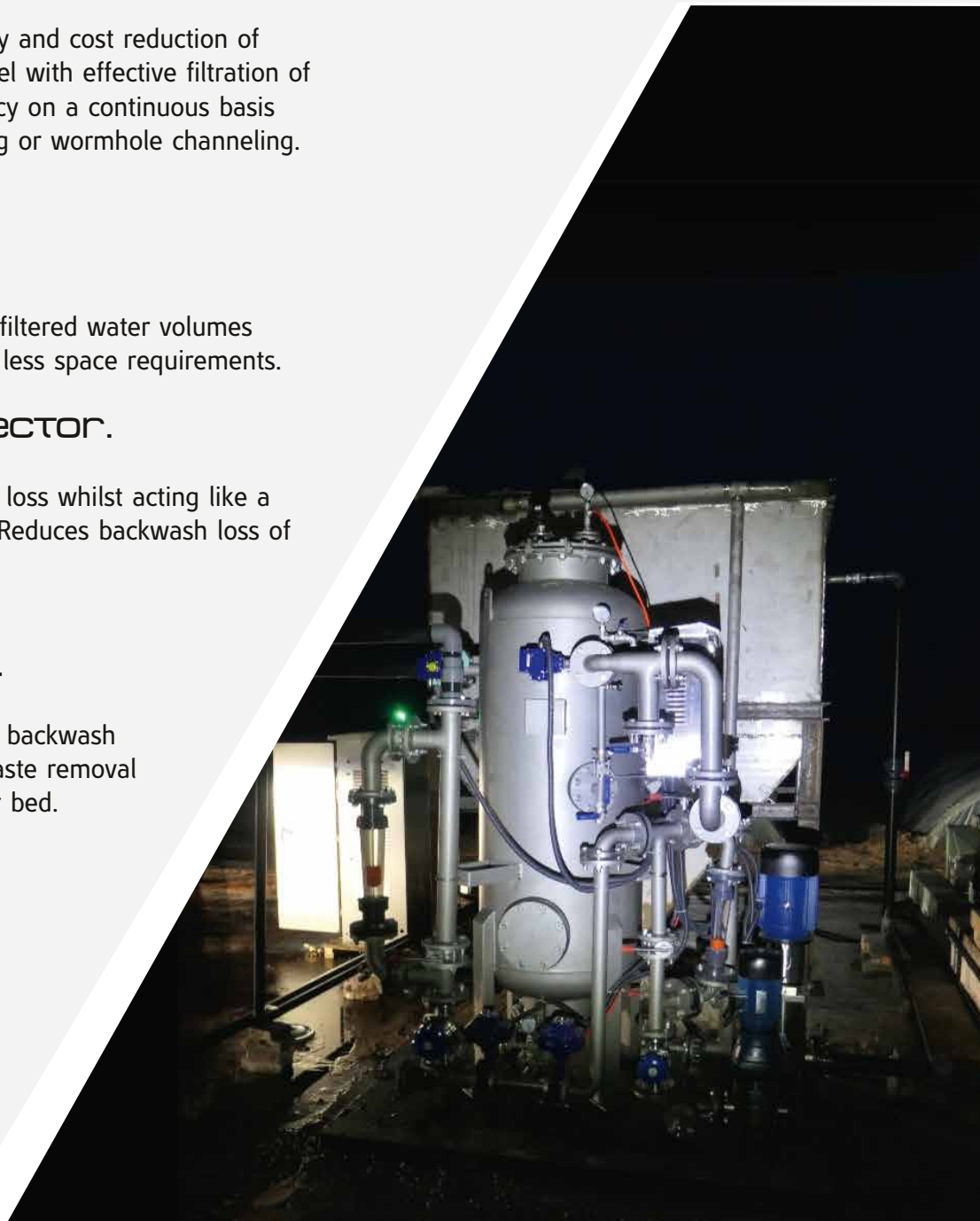
Results in even distribution of backwash flows resulting in excellent waste removal throughout the complete filter bed.

## TOP SECTION DESIGN

Reduces vessel height for safer working conditions whilst loading, and minimizes potential for bio fouling.

## OPERATING PRESSURE.

Operating pressures can be as low as 1 Bar minimising pumping power requirement





## USES AFM MEDIA

AFM® is an amorphous alumina-silicate manufactured by up-cycling post-consumer green glass bottles. AFM® is manufactured and offered as a direct replacement for filter sand and used in most types and designs of sand filter. The one exception is slow bed sand filters operating as biological filters at filtration velocities of less than 0.2m/h. AFM® rejects the growth of biofilm and as such it is not suitable for use in slow bed sand filters.

### PRODUCT KEY POINTS

1. Verified to provide a much better performance in comparison with high quality silica sand
2. Verified to achieve 99% filtration down to 3 microns with no coagulation or flocculation using grade 0, 1000mm bed depth 20m/h velocity
3. Verified to achieve 97% filtration down to 5 microns, with no coagulation and flocculation using grade 1, 1000mm bed depth 20m/h velocity
4. Return of investment measured at under 2 years by UK Carbon Trust and Oakdene Hollins
5. High surface negative charge density, works well with coagulants and flocculants to remove dissolved components and provide nominal filtration down to sub-micron level in certain applications
6. Bio-resistant, will not become a bio filter, AFM® is not subject to transient wormhole channeling, and unfiltered water will never pass the filter bed
7. Stable and predictable performance in freshwater and marine systems, perfect for SWRO
8. Product water will have at least 50% lower chlorine oxidation demand than an equivalent sand filter, so lower concentration of disinfection by products
9. SDI will be lower with AFM® in comparison to sand filtration
10. Future proofing against tighter legislation and regulation
11. AFM® is expected to last for the life of the filtration systems
12. AFM® is an engineered product manufactured to a precise specification under ISO9001-2008 conditions
13. Certified under Reg31, NSF50 & NSF61, Environmental standards, Singapore Green Tick, HCAAP approval imminent

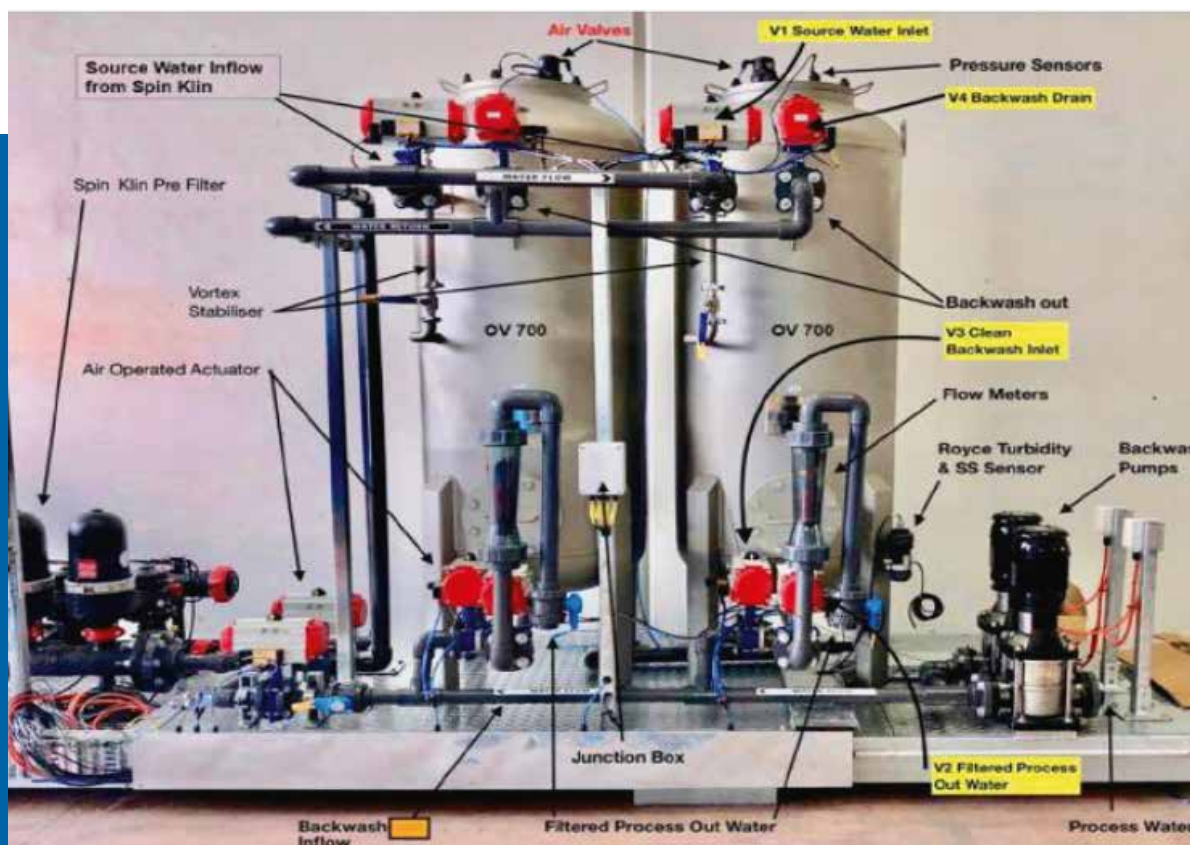


# COMPARATIVE TEST Results

Research Results with a loading of 70ppm of AC fine test dust/iron oxide dust/carbon dust  
Liverpool University 2007

## Comparison of a similarly sized standard Sand Filter vs. OV AFM Filter

|                                 | Sand Filter                              | OV AFM Filter                             |
|---------------------------------|------------------------------------------|-------------------------------------------|
| Flow Rate                       | 8 to 10 m <sup>3</sup> /h/m <sup>2</sup> | 50 to 60 m <sup>3</sup> /h/m <sup>2</sup> |
| Solids Load                     | 70 ppm                                   | 70 ppm                                    |
| Filter Area                     | 0.44m <sup>2</sup>                       | 0.44m <sup>2</sup>                        |
| Flow Rate                       | 5.5 m <sup>3</sup> /h                    | 21 m <sup>3</sup> /h                      |
| Efficiency                      | 70% at 10µm                              | >95% at 10µm                              |
| Filtration time before backwash | 12 hours                                 | 48 hours                                  |
| Pressure Drop                   | 0.8                                      | 0.8                                       |
| Backwash Time                   | 8 minutes                                | 3 minutes                                 |
| Backwash Volume Rate            | 20m <sup>3</sup> /h                      | 5.5m <sup>3</sup> /h                      |
| Backwash Volume Used 48 hours   | 10,000 litres                            | 250 litres                                |



# EXAMPLES

## In Use



### GLASS GRINDING WASTEWATER TREATMENT PROJECT

Wastewater comes from the grinding process of glass touch screens. Process out water is reused in the grinding process. Flow rate 160m<sup>3</sup>/hr.

Suspended solids in process inflow water 15mg/L.

In process out water <4mg/L



# EXAMPLES In Use



## RIVER water Treatment

Before treatment Suspended Solids 51mg/l and 48NTU..  
After treatment Suspended Solids <5mg/l and NTU <5.  
Flow Rate 50-68m<sup>3</sup>/hr.



# DAQING OILFIELD

## Wastewater Treatment

| Date       | Oil of process in (mg/l) | Oil of process out (mg/l) | Removal rate % | SS of process in (mg/l) | SS of process out (mg/l) | Removal rate % |
|------------|--------------------------|---------------------------|----------------|-------------------------|--------------------------|----------------|
| 09.08.2020 | 37.3                     | 1.4                       | 96%            | 62                      | 12.5                     | 80%            |
| 10.08.2020 | 127.2                    | 3.4                       | 97%            | 72                      | 11.7                     | 84%            |
| 11.08.2020 | 25.4                     | 4.2                       | 84%            | 46                      | 7.9                      | 83%            |
| 12.08.2020 | 43.4                     | 2.4                       | 94%            | 42                      | 6.7                      | 84%            |
| 13.08.2020 | 22.5                     | 4.2                       | 81%            | 46.8                    | 7                        | 85%            |
| 14.08.2020 | 81.66                    | 4.73                      | 94%            | 55.8                    | 6.2                      | 89%            |
| 15.08.2020 | 1.61                     | 0                         | 100%           | 45.7                    | 5.6                      | 88%            |
| 16.08.2020 | 27.8                     | 4.2                       | 85%            | 42.1                    | 5.4                      | 87%            |
| 17.08.2020 | 43.4                     | 2                         | 95%            | 52.8                    | 6.8                      | 87%            |
| 18.08.2020 | 2.8                      | 0.37                      | 87%            | 43                      | 4.1                      | 90%            |
| 19.08.2020 | 37.3                     | 1.4                       | 96%            | 62                      | 8.9                      | 86%            |
| 20.08.2020 | 142.9                    | 3.1                       | 98%            | 29.5                    | 4.5                      | 85%            |
| 21.08.2020 | 81.66                    | 4.73                      | 94%            | 23.5                    | 29                       | 88%            |
| 22.08.2020 | 39                       | 4.7                       | 88%            | 24                      | 3.9                      | 84%            |
| 23.08.2020 | 34.6                     | 2.1                       | 94%            | 28                      | 4.3                      | 85%            |



# EXAMPLES In Use



## COAL MINING PRODUCTION WASTEWATER TREATMENT

This project combines magnet powder separation technology and OV AFM 250 filter to treat the wastewater from the coal mining site to remove SS and turbidity to meet discharge standard of Class III water. The capacity is 2.5m<sup>3</sup>/h as an initial trial



# CONTACT INFORMATION

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Solari OV AFM Filter is suited  
to multiple filtration needs.

LET SOLARI HELP YOU WITH YOURS !

