DRYDEN AQUA
DISTRIBUTION
SUSTAINABLE WATER QUALITY

AFM®

ACTIVATED FILTER MEDIA

THE BEST **FILTRATION MEDIA** FOR WATER TREATMENT

ABOUT **DRYDEN AQUA**

Our mission is to provide products and solutions that have a positive environmental impact on our ecosystem. We help to make this world a better place - a non-toxic environment for everyone.

OUR **FACTORIES**

Dryden Aqua Distribution
Büsserach, Switzerland

Dryden Aqua Technology
Bonnyrigg, Scotland

OUR **OFFICES**

Dryden Aqua Germany
Weimar, Germany

Dryden Aqua North America
Dallas, TX, U.S.A

Dryden Aqua Asia
Shanghai, China

Dryden Aqua is one of the largest manufacturers of glass filtration media in the world, operating 2 most sophisticated & fully automated glass reprocessing facilities in the world; in Scotland and Switzerland. We are proud to provide innovative and cost-effective solutions for drinking water, food and beverage processing, industrial process water as well as municipal and industrial waste water worldwide.

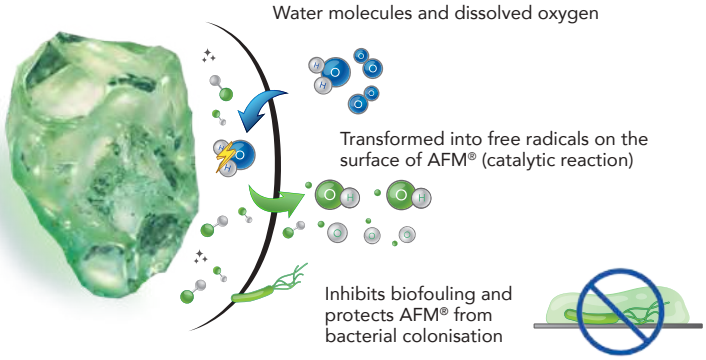
OUR **PRODUCT - AFM®**

AFM® is an inert, amorphous aluminosilicate (glass) manufactured by up-cycling post-consumer green and brown glass bottles. Activated Filter Media AFM® is verified to at least double the performance of sand filters without the need for additional investments in infrastructure. AFM® is used in single or dual media filtration in both open (RGF) and closed (pressure) filters for treatment of various sources of water such as ground water, surface water, seawater and waste water.

Take a virtual tour of our newest factory and learn how AFM® is produced

Two different types of AFM® are produced in our factories: AFM®s (standard) and AFM®ng (next generation). Both products are exposed to a unique 3-step activation process to become self-sterilising and to acquire superior filtration properties. During the activation, the structure and the chemistry of the glass is modified.

1 ▸ Self-sterilising surface



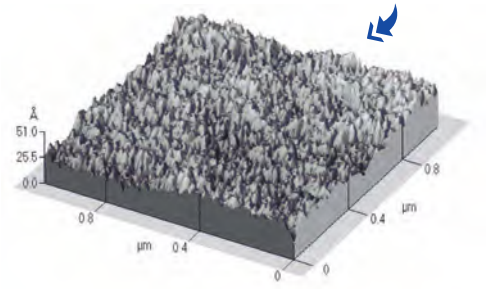
- Does not support bacterial growth, eliminates clumping, channeling and passage of unfiltered water.
- Reduces backwash water up to 50% providing a quick ROI, usually within 2 years.
- Improves and provides predictable, repeatable and consistent nominal filtration performance up to 98% and a life cycle >10 years.

2 ▸ Increased surface area

AFM® Grade 1 = 50.000 m² / 1'000 kg (245 ft² per lb) *
Sand 0.4 - 0.8mm = 3.000 m² / 1'000 kg (15 ft² per lb)

* Surface Area by Langmuir Isotherm Method

Mesoporous structure



- High surface area with superior mechanical filtration properties for adsorption of fine particles (see performance data on page 4).
- Precise, consistent particle size distribution, shape, sphericity and uniformity coefficient for outstanding hydraulic properties.
- High activated surface area amplifies catalytic reaction, generating free radicals to avoid biofouling on media surface.

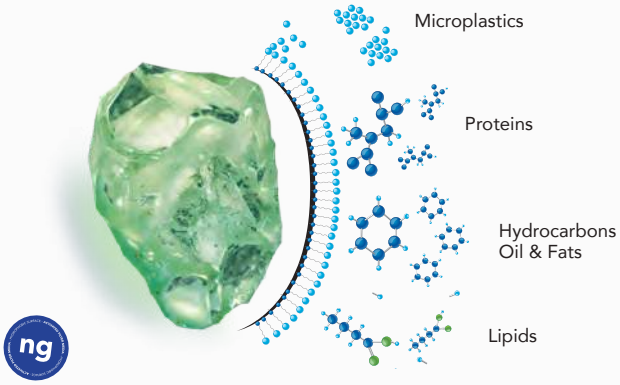
3 ▸ Advanced adsorption properties

AFM®ng: HYDROPHOBIC SURFACE

Hydrophobic, neutrally charged surface

Superior mechanical filtration performance , combined with efficient removal of hydrophobic contaminants such as hydrocarbons (oil & fats) organics and microplastics in both hard and soft water.

Best filtration performance & organics removal

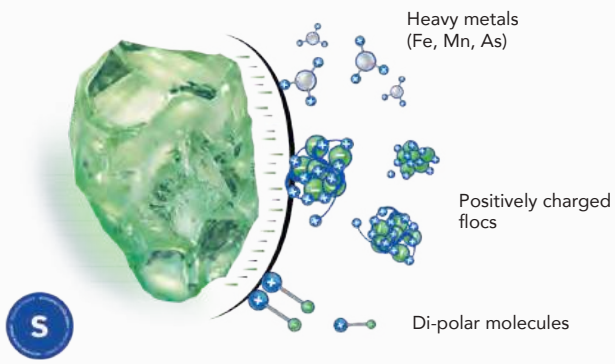


AFM®s: HIGH NEGATIVE SURFACE CHARGE

High negative surface charge

Robust and stable, high filtration performance media with a 20 year track record. Best suited for the removal of positively charged particles such as heavy metals (e.g. Iron, Manganese and Arsenic).

Best for heavy metals removal



AFM® GRADES & PERFORMANCE

Grade	Type	Particle size	Function
0	AFM®-s	0.25 - 0.5 mm	Extra fine filtration grade
1	AFM®-s/-ng	0.4 - 0.8 mm	Main filtration grade
2	AFM®-s/-ng	0.7 - 2.0 mm	Support and Filtration (ng) grade
3	AFM®-s	2.0 - 4.0 mm	Support (layer) grade
DIN	AFM®-s/ng	0.7 - 1.2 mm	Special filter media for wastewater and highly polluted water

AFM® Grade 0 is a extra fine filtration grade providing a 98% particle removal efficiency down to 1µm without the use of coagulation and/or flocculation.

AFM® Grade 1 is our main filtration grade. AFM® ng removes 95% of all particles down to 1µm. Coagulation and flocculation may be used to further enhance filtration performance down to submicron.

AFM®s Grade 2 is used as a support layer. AFM® ng Grade 2 acts as a support and filtration layer removing particles down to 5 µm.

AFM® Grade 3 is a support layer used to cover the laterals of a filter to ensure proper flow distribution during filtration and backwash of the filter.

AFM® DIN is used as single filtration madia or above Grade 3 in selected water and waste water treatment applications, removing 96% particles down to 4µm. It can be used as single media in DynaSand® filters.

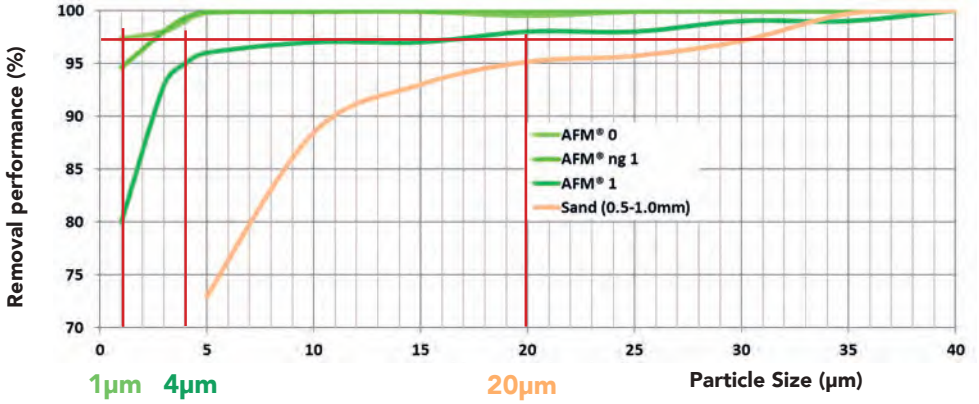
Note: In case of TSS >30 ppm or a turbidity >10 NTU, the use of an Anthracite layer on top of the AFM® bed may be considered to extend the run phase between backwash.

AFM® is supplied in 25 kg (55 lbs) bags or 1000 kg (2200 lbs) big bags

40 bags on CP1 pallet

24 pallets/truck or 20 pallets/20'FCL

Filtration performance of AFM® versus Sand at 20m/hr (8gpm/ft²) without flocculation



Independently verified by

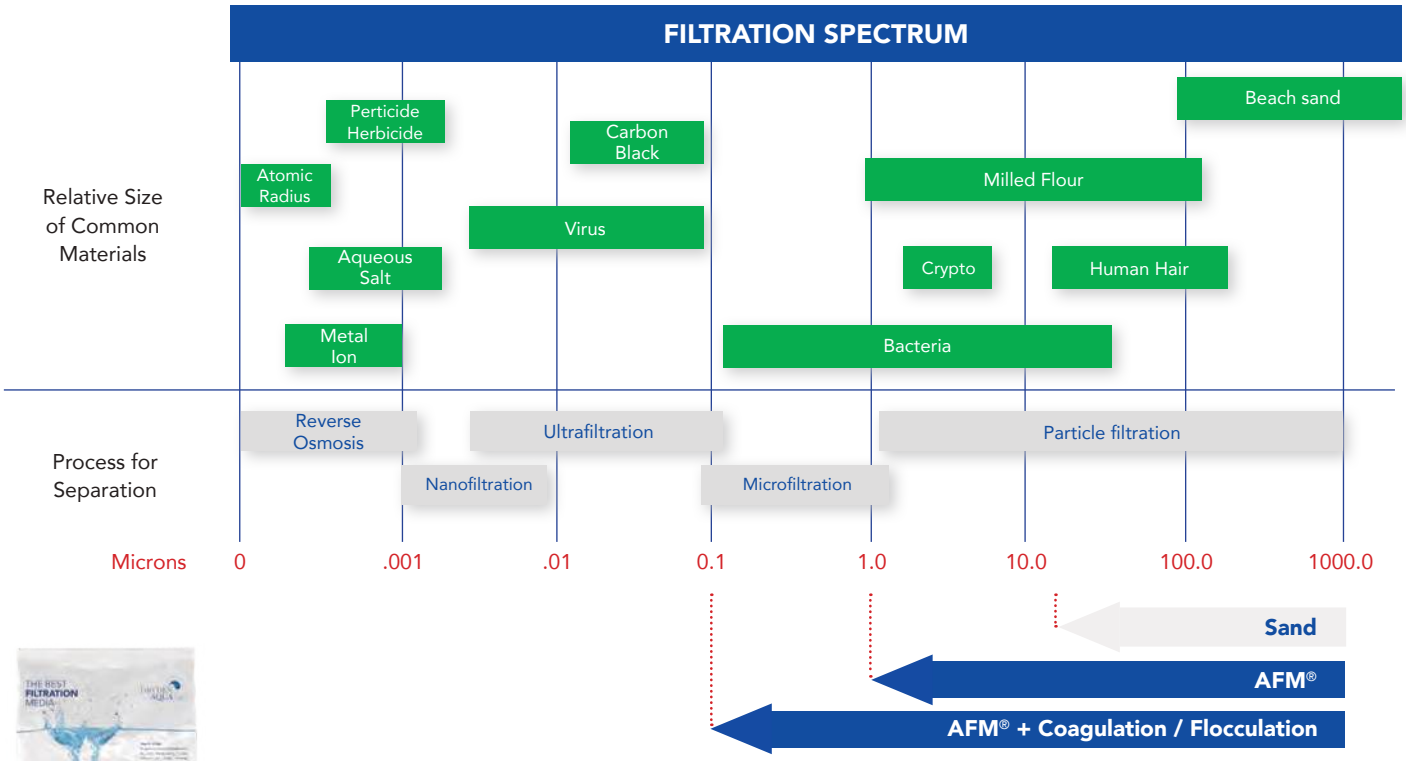
IFTS is a leading independent accredited laboratory in France specializing in water filtration
www.ifts-sls.com

- AFM®s Grade 0 removes 98% of particles >1µm
- AFM® ng Grade 1 removes 95% of particles >1µm
- AFM®s Grade 1 removes 95% of particles >4µm
- High quality silica sand removes 95% of particles >20µm

AFM® ACTIVATED FILTER MEDIA

- **Provides a stable & reliable filtration >1 micron without coagulation and/or flocculation**
- **Substantially reduces turbidity and SDI**
- **Is fully resistant to biofouling and channeling Lasts >10 years**

AFM® closes the gap between conventional media filtration and Ultrafiltration



AFM®ng or AFM®s Grade 1 can be used with organic coagulants such as PAC (Poly-Aluminium Chloride), $FeCl_3$ (Ferric-Chloride) or polymeric cationic or anionic flocculants to further improve fine particles removal performance and to provide an effective Cryptosporidium oocysts barrier up to 20m/h (8 gpm/ft²).

AFM® is certified:

- ISO 9001:2015, ISO 14001:2015 and 45001:2018
- **NSF/ANSI/CAN 61 & 372** certified by WQA for use in drinking water treatment
- Approved in UK under regulation 31 of the water supply (water quality regulations 2016 (as amended)
- Approved under Swiss drinking & bathing water regulation (TBDV)
- European Water Directive (98/83/EC) & (80/778/EEC) compliant
- HACCP certified for use in food & beverage production
- EN-12902 and EN-12904 compliant
- IFTS (Institute of Filtration and Techniques of Separation) independently tested and verified filtration performance

AFM® CERTIFICATIONS

NSF/ANSI/CAN 61

Approved in UK and Switzerland for use in public water supplies

DRYDEN AQUA DISTRIBUTION SUSTAINABLE WATER QUALITY

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WEBINAR
REVERSE OSMOSIS
PRE-TREATMENT

AFM® FOR PRE-TREATMENT
PRIOR TO REVERSE OSMOSIS

Pre-treatment in reverse osmosis (RO) systems is a critical process step where AFM® significantly improves the economics, sustainability and operation of an RO system.

In traditional filter media such as sand, biofilm and biomass formation cannot be avoided. This leads to clumping followed by channeling with consequent poor SDI and filtration performance.

AFM® removal performance of inorganic and organic suspended solids down to 1µm reduces RO membrane fouling potential. As a result, RO membrane bacterial growth (biofouling) is further reduced which increases RO system performance and availability.. Subsequently RO membrane lifetime is extended by reducing cleaning frequency (CIP's) and chemicals demand.

Benefits of AFM® vs Sand in RO pre-treatment

- Significantly improves SDI
- Highly reduces RO membrane fouling through superior >1µm particle removal
- AFM® self-sterilising surface highly reduces RO membrane biofouling potential
- Reduces or eliminates RO pre-treatment chemicals dosing (coagulant, chlorine, SMBS)
- OPEX savings: reduced exchange of cartridge filters, no backwash air scouring
- Guarantees a stable RO membrane performance & increases membrane lifetime

Benefits of AFM® in process and drinking water treatment

- Superior particle removal (TSS) and strong reduction of turbidity (NTU)
- No channeling and safe barrier against bacteria and viruses (Cryptosporidium, E.Coli, etc.)
- Exceptional removal of suspended heavy metals
- Reduces TOC, oxidation demand and consequent formation of harmful DBP's
- Offers substantial backwash water savings and outlasts all other filter media
- NSF/ANSI/CAN-61 certified by WQA, Approved for use in Swiss and UK public water supplies, HACCP certified for use in F&B production

AFM® FOR PROCESS AND
DRINKING WATER TREATMENT

In ground and surface water treatment, AFM® significantly outperforms sand in terms of particle removal and - thanks to its unique adsorption properties - will also remove a much higher percentage of heavy metals, organics and microplastics from water. In addition AFM® strongly reduces the biological risk from bacteria, viruses and parasites.

Due to it's self sterilizing surface, AFM® reduces the disinfection chemical demand - such as chlorine - and therefore minimizes the formation of disinfection by-products (DBP) such as THM's.

Note: AFM® ng offers a significant performance advantage in soft water over sand and AFM® s, where media filtration performance is challenged in water with low TDS (<50mg/l), low Calcium hardness (<20mg/l) and low alkalinity (<50mg/l).

WEBINAR
DRINKING WATER
TREATMENT

DRYDEN AQUA
SUSTAINABLE WATER QUALITY

AFM® FOR
WASTEWATER TREATMENT

Municipal or industrial waste water can contain high organic and bacteria load which leads to biological growth in sand and other conventional filter media. This results in filter media clogging and channeling, requiring frequent backwash including air scouring. Over time, filtration performance cannot be restored using backwash, leading to a reduced availability and frequent filter media replacement.

AFM® replaces sand and other filer media in industrial and municipal wastewater treatment without the need for modifications. As no biofouling occures on the unique self sterilizing surface of AFM®, a consistent high filtration performance can be achieved. Consequently AFM® offers a sustainable and superior alternative to sand and other filter media. Air scouring is not required during backwash of AFM®, generating additional savings in energy, time and backwash water.

Wastewater containing oil such as in O&G produced water, AFM® is used to retrofit nutshell filters, strongly improving oil removal to >90% with Oil dropplet size down to >4µm.

WEBINAR
WASTEWATER TREATMENT

Benefits of AFM® in wastewater treatment

- Removes 95% of >1µm particles. Reduces turbidity and TSS up to 90%
- No biofouling of AFM® strongly increases filtration performance versus sand filters
- Robust filter media for a predictable and consistent filtration
- Backwash restores AFM® performance achieving a lifetime >10 years
- AFM®ng efficiently removes hydrocarbons (oil & fat) and microplastics

Benefits of AFM® in cooling water treatment

- Removes organics and solids to control pathogenic bacteria such as Legionella
- AFM® self sterilizing surface reduces chemicals consumption by up to 50%
- No scaling on the AFM® surface provides for stable & consitent filtration performance
- Reduced OPEX by increased heat transfer & cooling water process performance

AFM® FOR
COOLING TOWERS

As cooling tower circulates water via heat exchangers, some of the water continuously evaporates and some is "blown down" when water salinity reaches high TDS level. Make-up (fresh) water is added to compensate the loss of evaporation. Chemicals such as biocides, corrosion inhibitors and antiscalants are constantly added to reduce corrosion, biofouling and scaling potential.

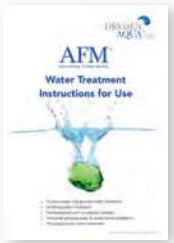
Due to high nutrient load in the recirculated water, bacteria grow a biofilm in the sandfilter which reduces it's filtration performance. Organics and bacteria including pathogens such as Legionella, are released from the sand filter and in the cooling tower, resulting in increased treatment chemicals demand and cost as well as public health risks.

Due to its self-sterilzing surface and high filtration performance, AFM® is the perfect filter media for cooling water treatment. AFM® eliminates the disadvantages of sand for this application.

DOWNLOAD OUR AFM®
CASE STUDIES

DRYDEN AQUA
SUSTAINABLE WATER QUALITY
DISTRIBUTION

For further information on AFM® applications and detailed instructions please consult our IFU

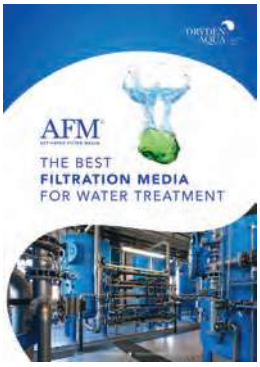


AFM®
ACTIVATED FILTER MEDIA

Scan the QR code to go to our website download section

AFM® Instructions For Use

Download this **AFM® Water Treatment Brochure**



Our AFM® Webinar Series will significantly increase your knowledge in media filtration using AFM® in water treatment

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ACTIVATED FILTER MEDIA
WATER TREATMENT WEBINARS
KNOWLEDGE IS POWER!

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