Gravity sand filters

autonomous and valveless

AGF

The simplest automatic sand filter

The challenge

The removal of contaminants from water systems to provide clean water is critical for a number of purposes including:

- cooling systems
- drinking water
- final effluents
- process and plant supply

Are you unhappy with traditional methods of sand filtration such as pressure and moving bed filters that have high levels of automation or require operator involvement and are often unreliable and difficult to manage? Is your maintenance on these a headache?

Do you require new or replacement sand filters?

The solution

Clean up your systems with one of the simplest sand filters on the market capable of meeting this challenge - the Autonomous Gravity Sand Filter (AGF). Once installed the system has virtually no running costs. It is completely automatic and totally self-contained and operates with no instrumentation, backwash pumps or similar.

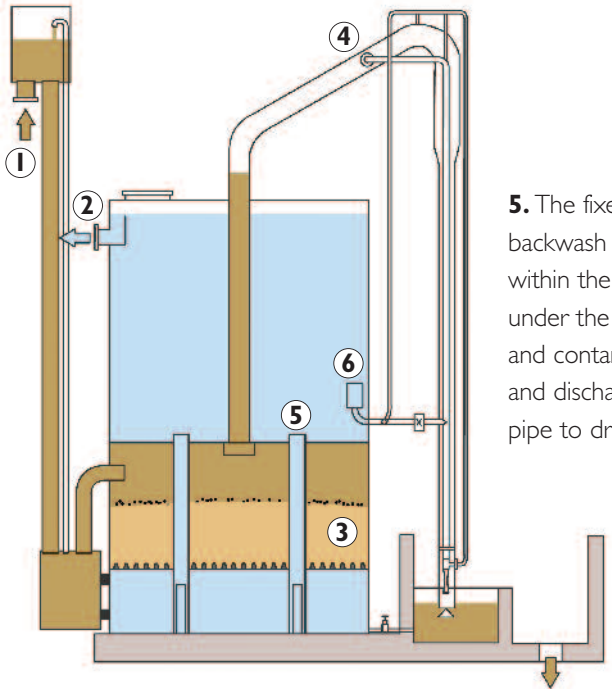
The backwash function of the AGF is self-initiated and only backwashes itself when necessary, using a pre-stored volume of already filtered water, on the loss of head principle and therefore, the backwash occurs precisely when it is needed at any time.

These filters are renowned for working for long periods without needing any operator attendance or maintenance whatsoever. Filtration in the AGF filter is also excellent since conservative ratings are used together with a uniform backwash rate and volume ensuring that the sand bed being backwashed is always maintained in optimum condition.

How it works

1. Contaminated water is introduced to the filter via a header tank from where it is fed into the central filtration compartment where contaminants are retained.

2. The filtered water then gravitates into the bottom filtrate collection compartment from where a series of pipes transfers it to the top backwash storage compartment with flow to service then commencing.



3. As contaminants accumulate in the sand-bed a pressure drop develops which causes a rise in the level of the column of water in the backwash pipe.

4. At the geometrically built-in maximum water level, a flow of water occurs through a simple evacuation system that initiates the backwash within a short period.

5. The fixed volume of filtered backwash water which is stored within the unit is passed back under the sand bed which expands and contaminants are removed and discharged via the backwash pipe to drain.

6. The backwash is subsequently terminated when the backwash storage compartment is depleted. On completion of backwashing the filter reverts to filtering mode, re-fills itself and flow to service is once again established.

The above describes a single bed filter in operation. Double bed units are also available where twice the flow can be achieved through the same footprint.

FILTERSOLUTIONS

Applications

- Iron and manganese removal
- Make-up water for cooling systems
- Plant supply water
- Potable water
- Side-stream filtration of sea and ground water cooling systems
- Tertiary treatment and final effluent filtration
- ...and many others

Industries

- Automotive
- Brewing
- Brine processing
- Chemical
- Food
- Minerals
- Mining
- Municipal final effluent
- Municipal water
- Oil & gas
- Petrochemical
- Pharmaceuticals
- Plastics
- Power generation
- Refining
- Rubber
- Steel
- Tyres
- ...and many others

CASE STUDY 1

Application
Side-Stream Filtration of re-circulating ground water cooling system

Location
Power Station, South Africa

Operating data
1 x 4.2m diameter, single bed, maximum flow 140m³/hr

CASE STUDY 2

Application
Bore-Hole water, iron, manganese and solids removal for drinking purposes

Location
Municipal Water Treatment Works, UK

Operating data
2 x 7.5m diameter, single bed, maximum combined flow 890m³/hr

CASE STUDY 3

Application
River water solids removal for process requirements

Location
Gold mine, West Africa

Operating data
2 x 3.0m diameter, single bed, maximum combined flow 140m³/hr

CASE STUDY 4

Application
Final Municipal Effluent solids removal to meet consent levels before discharge to river

Location
Municipal Waste Water (Sewage) Treatment Works, UK

Operating data
3 x 4.5m diameter, single bed, maximum combined flow 480m³/hr

Features and Benefits

FEATURES	BENEFITS
Construction and installation	
• Supplied in a wide range of diameters	• Covers a wide range of flow rates
• Optimised design parameters	• Constant efficient operation
• Straightforward installation	• Configuration as per customer requirements
• Double bed version available	• Twice the flow for the same footprint
	• More manageable backwash
	• More cost efficient
Operation	
• Extremely simple operation	• Fit and forget filters
• Autonomous mechanical operation	• Ideal for use in zoned hazardous areas
	• No electrical requirements for operation
• Automatic backwash only when necessary on loss of head principle	• Human error eliminated as filters can not backwash too early or too late, too fast or too slow
• No backwash pumps or automatic valves needed for operation	• Stores own reservoir of backwash water for backwashing purposes when required
• No pressurised water required	• Either gravity flow or low lift pumps to get feed to inlet tank
• Minimal running costs and operator involvement	• Lifetime costs lower than other systems
• Larger flow rates through a single unit compared to other designs	• Less units required
• For standard applications no air required for backwashing	• Manual or automatic air scour facility can be built in when required, e.g. final effluents
Maintenance	
• Minimum wear and tear, reduced maintenance	• Less manpower required

Technical Data

● Areas of application		Filtration of water, final effluents and process liquids
● Flow rates -	Single Bed Units	Up to 1130m³/hr
	Double Bed Units	Up to 2260m³/hr
		Unlimited in multiple units
● Nominal line sizes		50 to 800 mm
● Flange connections		As per requirement
● Filtering levels		Influent max. ± 50 mg/l
● Operating pressures		Atmospheric
● Temperature -	At sea level	Up to 70°C
	At 3000m	Up to 30°C
	Intermediate	Between above
● Materials of construction		Carbon steel, Stainless Steel
● Manufacturing		Sound engineering practice
● Corrosion protection		Painting as per requirement
● Filter medium		Sand, Anthracite and others as per application
● Backwashing medium		Filtrate
● Controls		For standard cooling, drinking and process applications - none. Where biological containments are present, for example in final effluents, manual 'or fully automatic air-scouring available.

Technical details above are typical.

Automatic backwashing / No hassles / Low maintenance - Sound interesting?

If you are looking for filters with a difference that give all of the above and more, together with proven track records, backed up by solid references and many years of product history - then for all your filtration and purification needs, contact the specialists

FILTERSOLUTIONS

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