A new technology for sustainable, cost-effective and environmentally responsible water production

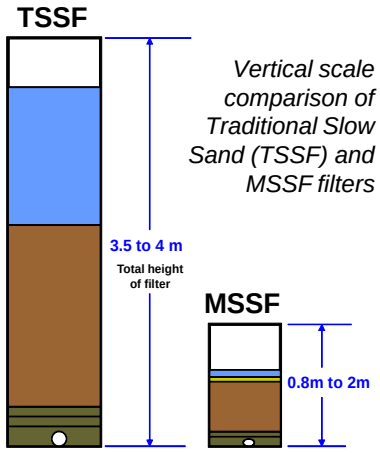
Oasis Filter International Ltd. presents a new technology to meet the demand for safe water in a sustainable, cost-effective and environmentally responsible manner. The Manz Slow Sand Filter™ (MSSF) has applications in all markets (developing, emerging and developed countries), scalable from 240 to 15,000,000 litres (60 to 4,000,000 gallons) per hour.

Many communities are deprived of safe water, including in North America[1], simply because until now an affordable solution was not available. Appropriate for use at any scale, its affordability, ease of maintenance and simplicity of operation makes this new water treatment technology uniquely suitable for smaller communities.

The MSSF, patent pending, is a novel variation of the Traditional Slow Sand Filter (TSSF) which meets the well-established performance standards of the TSSF for pathogen removal (parasites, spores, bacteria and viruses). The MSSF is novel as the first slow sand filter that allows demand operation with ease of cleaning (using a backwash process under low pressure).

4500 litres per hour MSF near Bahia Solano, Choco, on the remote Pacific coast of Colombia

50,000 litres/hour MPSF based water treatment plant for manganese removal in Stavely, Alberta, Canada (pop 450) Above: exterior of plant and reservoir Below: cells prior to installation of media



Vertical scale comparison of Traditional Slow Sand (TSSF) and MSSF filters

Manz Slow Sand Filter™ (MSSF)

- Meets AWWA standards for slow sand filter design and specification of filter media.
- Demand operated.
- Cleaned using backwash procedures

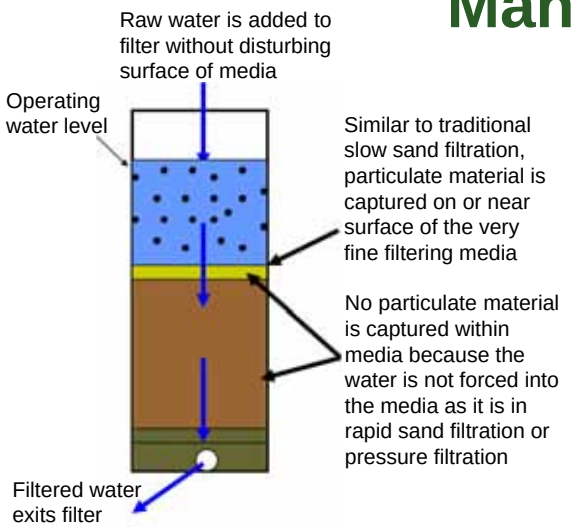
Manz Polishing Filter™ (MPSF)

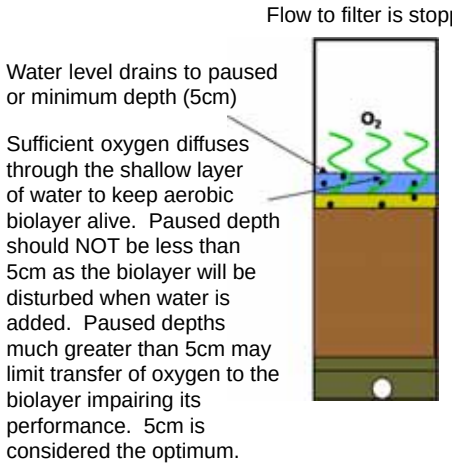
- Ease of cleaning allows a wider range of water treatment applications exploiting the unique ability of TSSF to remove small particles.

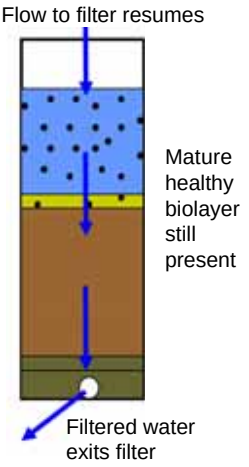
US, Canada and international patents pending

[1]*49 Million In U.S. Exposed to Dangerous Water - The New York Times | Tuesday, Dec. 8, 2009*
See article at:
http://www.nytimes.com/2009/12/08/business/energy-environment/08water.html

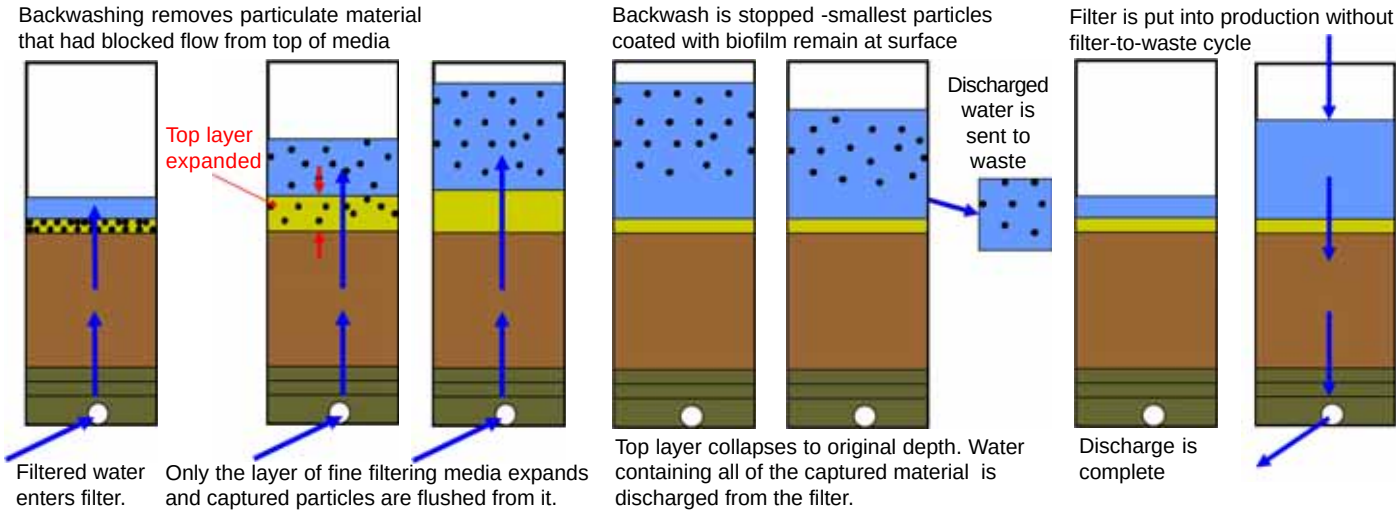
Manz Slow Sand Filter™ (MSSF)







Demand Operated



Cleaned using a backwash process

Entire cleaning process takes less than 30 minutes for very large filters. No media is removed or needs to be replaced. The wastewater does not represent a biohazard or a disposal problem if chemicals are NOT used. Recycling wastewater may be practical.

The TSSF in comparison:

- Must be operated continuously or the biological layer ('schmutzedeke') responsible for removal of micro-organisms will be damaged or killed.
- Beginning of operation: no biofilm around particles and no biolayer. Biolayer forms with use and time.
- Biolayer thickens and captured material accumulates and starts to restrict flow. Flow becomes unacceptably low and filter must be scraped.
- Layer of filter bed is removed (scraped) from top and discarded. The scraping process will remove the biolayer which must reform over time.
- Successive scrapings will reduce the filter depth to the minimum level and the media must be replaced, a costly and time-consuming process

Cleaning a Traditional Slow Sand Filter (TSSF) at the Vartry Water Treatment Works, County Wicklow, Ireland (March 2009). Built in 1868 to supply Dublin City and environs.

MSSF technology advantages:

- Offers a much wider range of pathogen, particulate and toxin removal than any other traditional sand filtration technology.
- Simple design and ease of operation create an environmentally efficient and more reliable supply of safe water, with fewer breakdowns, less chemical use or waste water production.
- May be manufactured using the most cost-effective local material, whether precast or poured in place concrete, steel, aluminum, fibreglass or plastic. Other competing systems, due to their complexity require imported components and have significant ongoing maintenance and operation support expense.
- Inexpensive piloting process to assure effectiveness in treating specific water.
- Ideal for small community applications due to ease of maintenance and operation, responding to local needs and objectives.
- Can be prefabricated or skid mounted for transportation to remote areas or for widespread introduction in developing countries.
- May be operated manually or with minimal energy sources including alternative energy.
- Larger systems provide a range of automation from minimal to completely automated.

40 litres per hour pilot plant (above) and bench scale testing (below)

MSSF based treatment systems effectively remove:

- Particulate matter (sand, silt and clay sized with or without use of coagulants)
- Parasites including Giardia cysts and Cryptosporidium oocysts
- Helminthes and their eggs
- Spores
- Bacteria
- Viruses
- TOC/DOC (taste, odour, colour)
- Toxins
- Algae

The MSF meets American Water Works Association Guidelines or Standards for 'slow sand filter design' and 'specification of filter media'.

- Maximum Loading of 200 to 400 litres per hour per m^2 of filter surface as per local regulatory guidelines.
- The depth of the filtering media in the MSF equals the minimum depth recommended for the TSSF. The minimum depth is thought to be necessary for deactivation of viruses.

Manz Polishing Sand Filter™ (MPSF)

MPSF based treatment systems, in addition to what MSSF based systems do, also effectively remove:

- Iron (directly or using pre-oxidation)
- Manganese (directly or using pre-oxidation)
- Hydrogen sulphide (using pre-oxidation)
- Arsenic (using pre-oxidation and coagulants)
- Fluoride (using lime and coagulants)
- Heavy metals (with use of appropriate coagulants)

The MPSF is the most appropriate technology available to remove arsenic for small to large communities.

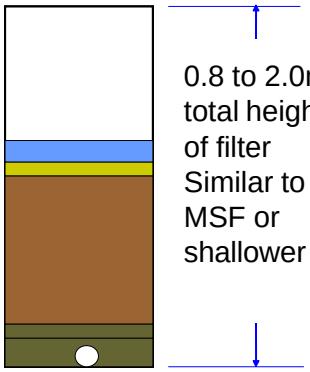
MPSF based treatment systems may be used to treat:

- Surface water, ground water, storm water runoff, rain water
- Brackish or saline water as part of pre-treatment for desalination process
- Industrial, agricultural or municipal wastewater to condition satisfactory for reuse and recycle or disposal

The MPSF also has application as polishing filtration for municipal wastewater that has been treated to tertiary (perhaps secondary) standards

MPSFs are constructed and operated in a similar manner to MSF technology with all of the same advantages.

MPSF based treatment systems are simpler and less expensive than treatment systems using other filtration technologies.



0.8 to 2.0m total height of filter Similar to MSF or shallower

Loading up to 600 litres per hour per m^2 of filter surface area or greater

Oasis Filter International Ltd.

MPSF technology advantages:

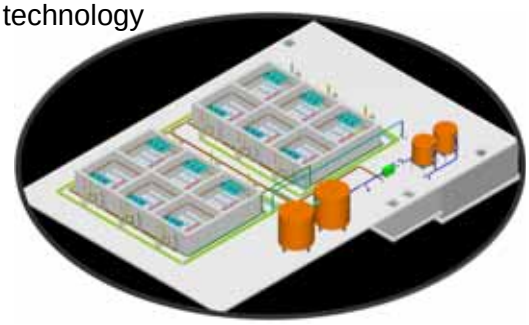
Simple to clean and does not consume any filtering media. Pretreatment using low concentrations of coagulant is very effective and practical.

	Removal Rate %	
Metal	TSSF	MPSF
Oxidized Iron	Not Used	Up to 100
Oxidized Manganese	Not Used	Up to 100
Arsenic with pre-treatment	Not Used	Up to 100
Mercury with pre-treatment	Not Used	Up to 100
Lead with pre-treatment	Not Used	90 - 99

	Removal	
Dissolved Substance	TSSF	MPSF
Organic toxins	Variable	Variable
Inorganic toxins	Variable	Variable
Colour	Variable	Variable
Fluoride with pre-treatment	Not Used	Effective
Hydrogen Sulphide with pre-treatment	Not Used	Effective
Odour with pre-treatment	Not Used	Effective

Current Projects in Canada (under construction and tendering)

Water treatment plant using MPSF technology in Exshaw, Alberta (left and above) currently under construction: 50,000 LPH expandable to 100,000 LPH.
Water treatment plant using MPSF technology in Saskatchewan, Canada (right) to be constructed in early 2011: 100,000 LPH.



David Manz detailing protocol for use of BSF filters for arsenic removal in rural Bangladesh (August 2006)

David H. Manz, Ph.D., P.Eng., P.Ag., is the inventor of both the MSSF and the BioSand Filter™(BSF) water filter technologies and 50% owner of Oasis. He brings over 25 years consulting experience in water related industries of private and publicly owned water and wastewater treatment firms.

David Manz achieved acclaim in the early 1990's with his invention of the BSF, a variation of the traditional slow sand filter to allow intermittent usage instead of the continuous operation required previously. The BSF was a humanitarian breakthrough. Today, over 300,000 households in over 100 countries - more than a million people worldwide - are provided safe drinking water from the BioSand Filter™, a product endorsed by the World Bank and World Health Organization. From the outset, David Manz has allowed production of the household BSF concrete filters to be royalty exempt.

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