

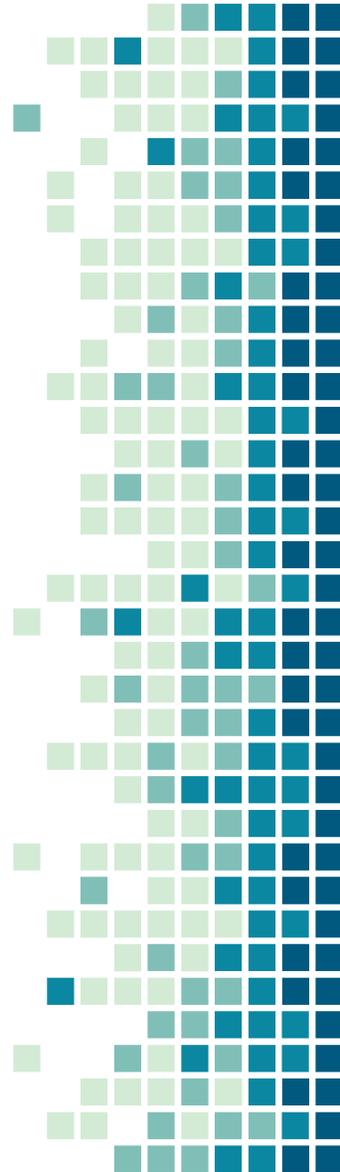
MTB
Multitank Bioreactor
by
Winflow Water



Our Company



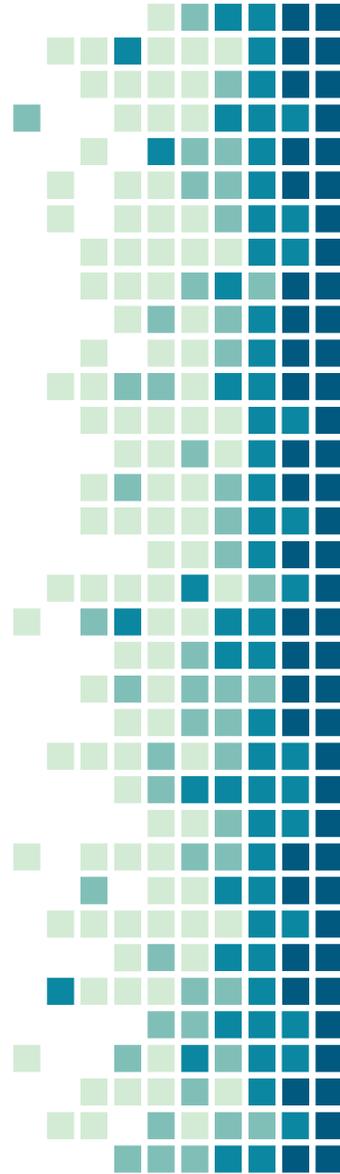
- ❖ Winflow Water is a Finnish company founded in 2012 to patent and commercialize the MTB technology
- ❖ MTB Technology
 - First patent in Finland, Worldwide patenting in progress
 - Research at Tampere University of Technology supervised by prof. Jukka Rintala
- ❖ In addition to MTB technology, Winflow Water provides:
 - WWT and potable water solutions and consultation
 - Remote monitoring and control solutions



MTB – the solution

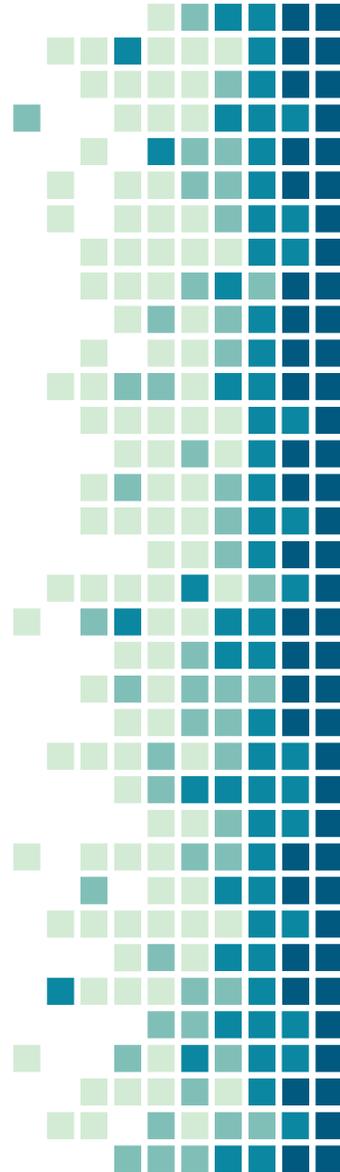
- ❖ Provides better total solution than conventional biological processes
 - Higher nutrient removal rates with lower CapEx and OpEx
 - Better intrinsic robustness and tolerance to shock loads
- ❖ Excellent for augmenting, newbuild as well as retrofitting
 - Retrofitting to existing vessels is practical by adding dividers
- ❖ Applicable for large scale municipal and industrial utilization
- ❖ Can also be scaled down for under 500 PE plants
- ❖ Also most suitable for water reuse

- ❖ The simplicity of the system combined with superior performance is unparalleled solution



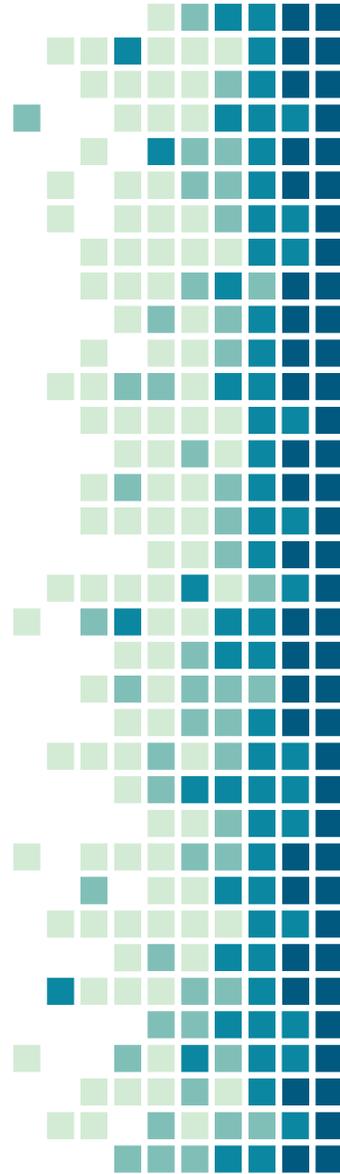
MTB – What makes it different ?

- ✦ **Alternating environment creates conventional selectors (feast-famine, oxic-anoxic) and fast settling sludge (favours granulation)**
 - Nutrient concentrations differ between consecutive vessels
 - DO and ORP alternate between time points in cycle
- ✦ **Controlled biomass circulation introduces a new orthogonal selection pressure which affects the enzyme production of microbes**
 - Microbes spend long time in one vessel before circulating to another vessel
 - Encourages new survival strategies expressed by non-genetic memory
- ✦ **Desired performance is achieved by adjusting the process parameters and reactor residence time**
 - The operator will quickly get familiar with adjusting parameters and understanding the effects



MTB – What makes it better ?

- Simultaneously favours populations with very high speed and nutrient absorbance at very low concentrations
- Low SVI (50..80) and higher viability of biomass
- Better effluent also at much higher F/M ratios
- High total nitrogen removal with single pass (60-80%)
 - With added carbon source over 95 %
- Intrinsic sludge optimization and excess sludge removal without any operator action



Costs

⚡ Lower CapEx:

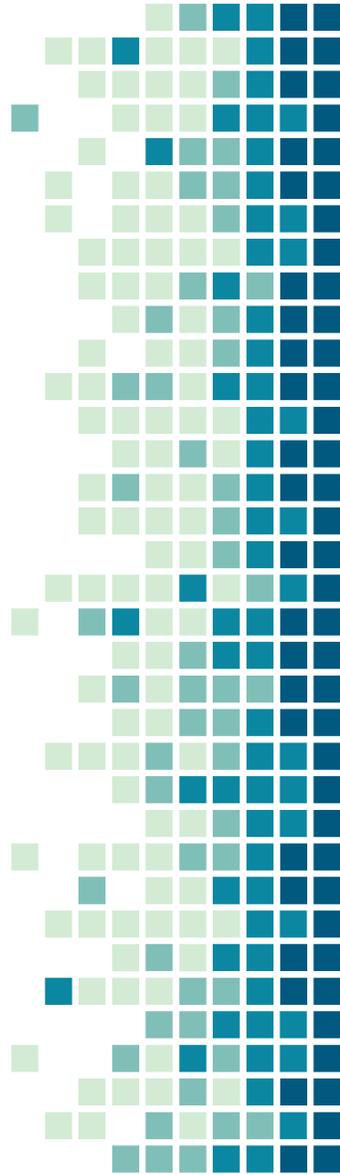
1. Lower HRT → Smaller volumes
2. Low effluent TSS → Low clarifier loading, or no clarifier
3. High tot-N reduction → less recycling
4. Simplicity of the system, standard components

⚡ Savings in biological process and clarifier up to 60 % in CapEx

⚡ Lower OpEx:

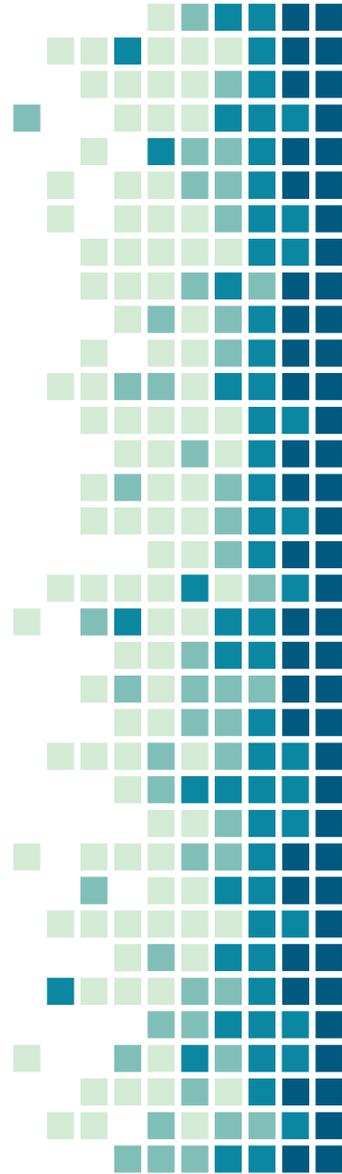
1. Single pass process → Less energy to pumping and aeration
2. Less maintenance, operator time and expertise

⚡ Savings up to 20 % in OpEx



Status of development and way forward

- Currently developing of complete modular WTP for 500 PE
 - Shipment world wide in 2 modules á 40 ft.
 - Target price << 200 k€ for practically any municipal WW
- The way forward
 - Already access to small scale WTP and food industry segments
 - Entry is ongoing to industrial and municipal fields on domestic market
 - Entering to markets in Europe and Asia including water reuse
 - Actively searching more co-operating partners and licencees
 - Empowering our company with new resources and funding



THANK YOU !

Questions?

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