TACKLING MICROPOLLUTANTS IN WASTEWATER

INNOVATION PROGRAM - SESSION 5

AQUATECH Amsterdam – November 4th 2021

MicroForce++

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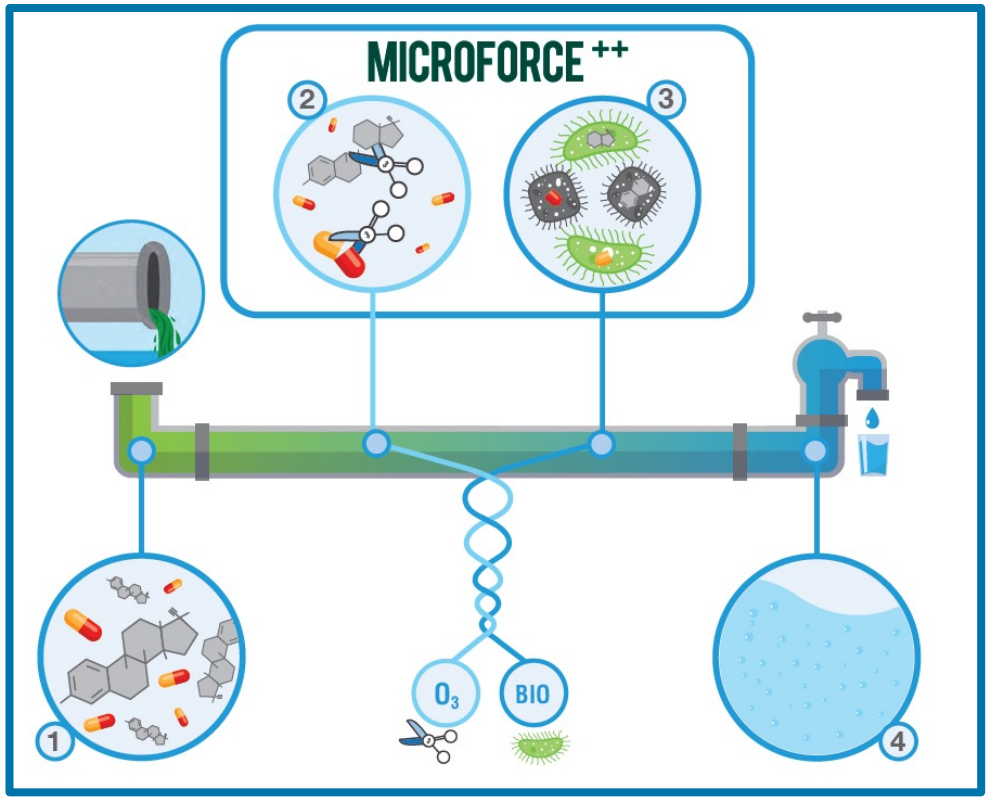
PURE
BLUE
returning water
to its natural state.
PureBlue
KWR
WAGENINGEN
UNIVERSITY & RESEARCH
Primozone
WaterschapScheldestromen
UNIVERSITY
OF APPLIED SCIENCES
AM TEAM
Advanced Modelling for process optimisation
UNIVERSITEIT
GENT

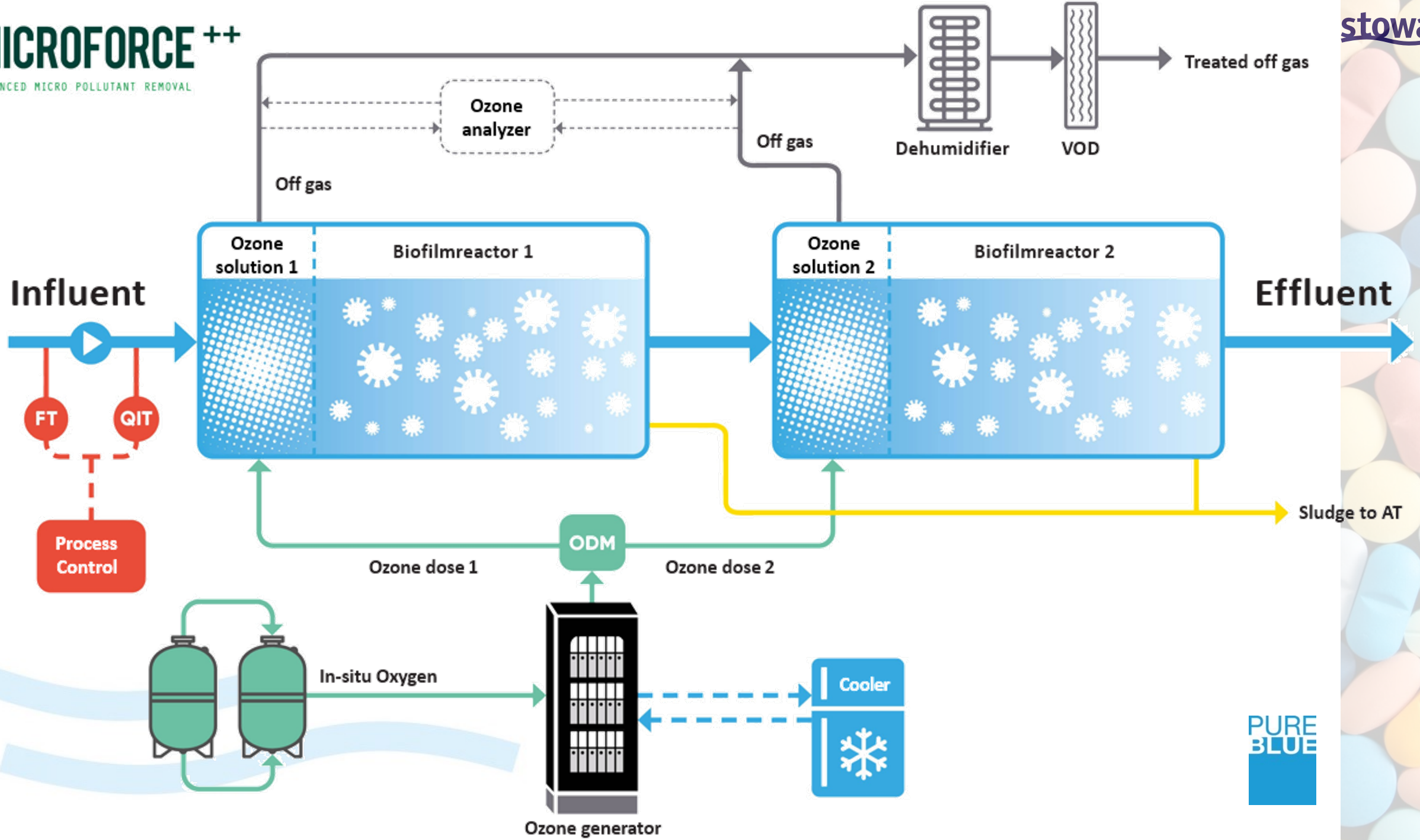
MicroForce^{++}

- Intertwining O_3 + Microbiology
- Lower DBP formation (e.g. bromate)
- Lower CO_2 footprint & energy consumption
- Compact & modular
- Extra removal of nutriënts & SS



MICROFORCE ++
ADVANCED MICRO POLLUTANT REMOVAL

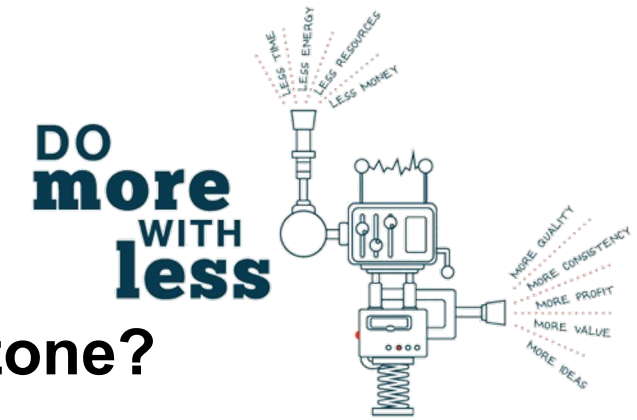
stowa



PURE BLUE

Innovation program (IPMV 2020)

Research questions



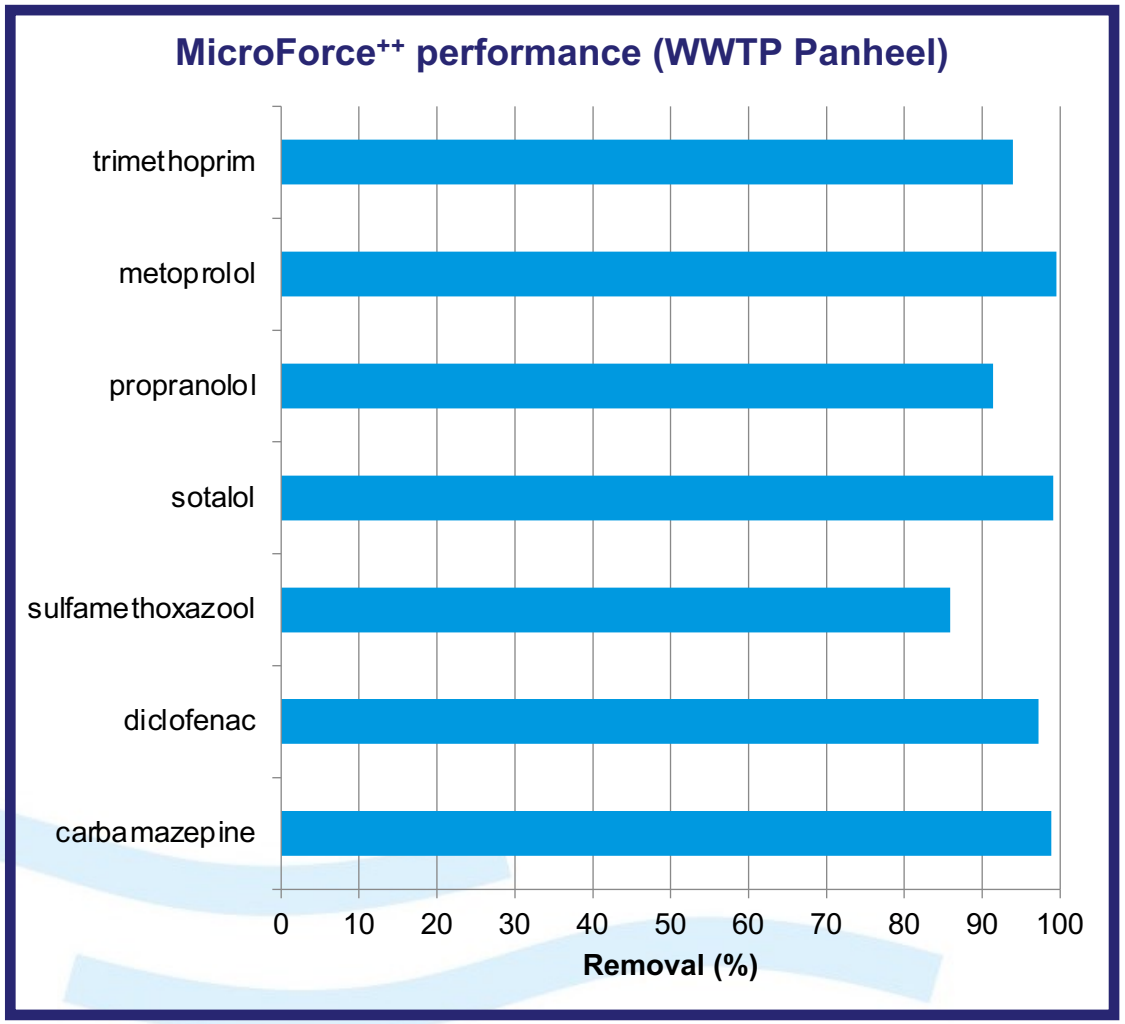
- Can MicroForce^{++} remove <u>more</u> OMP with <u>less</u> ozone?

- What is the impact of a biological step on API removal efficiency, CO_2 footprint & TCO?

- What is the best approach to apply MicroForce^{++} on WWTP's in NL?

References

WWTP Panheel (2016) – TKI



IPMV 2020 – Feasibility study MicroForce^{++}

	Unit	Ozone + SF		MicroForce^{++}
CO_2-footprint	g CO_2/m^3 [1]	130	- 55% →	59
Costs	€/m^3	0,17	- 65% →	0,06
Removal efficiency Guide substances Ministery I&W	% [2]	80-85	+ 10% →	85-95

[1] *Per m^3 wastewater treated*

[2] *Removal efficiency method for minimal 7 out of 11 substances: benzotriazole, claritromycine, carbamazepine, diclofenac, metoprolol, hydrochloorthiazide, 4-,5-methylbenzotriazole, propranolol, sotalol, sulfamethoxazol, trimethoprim.*

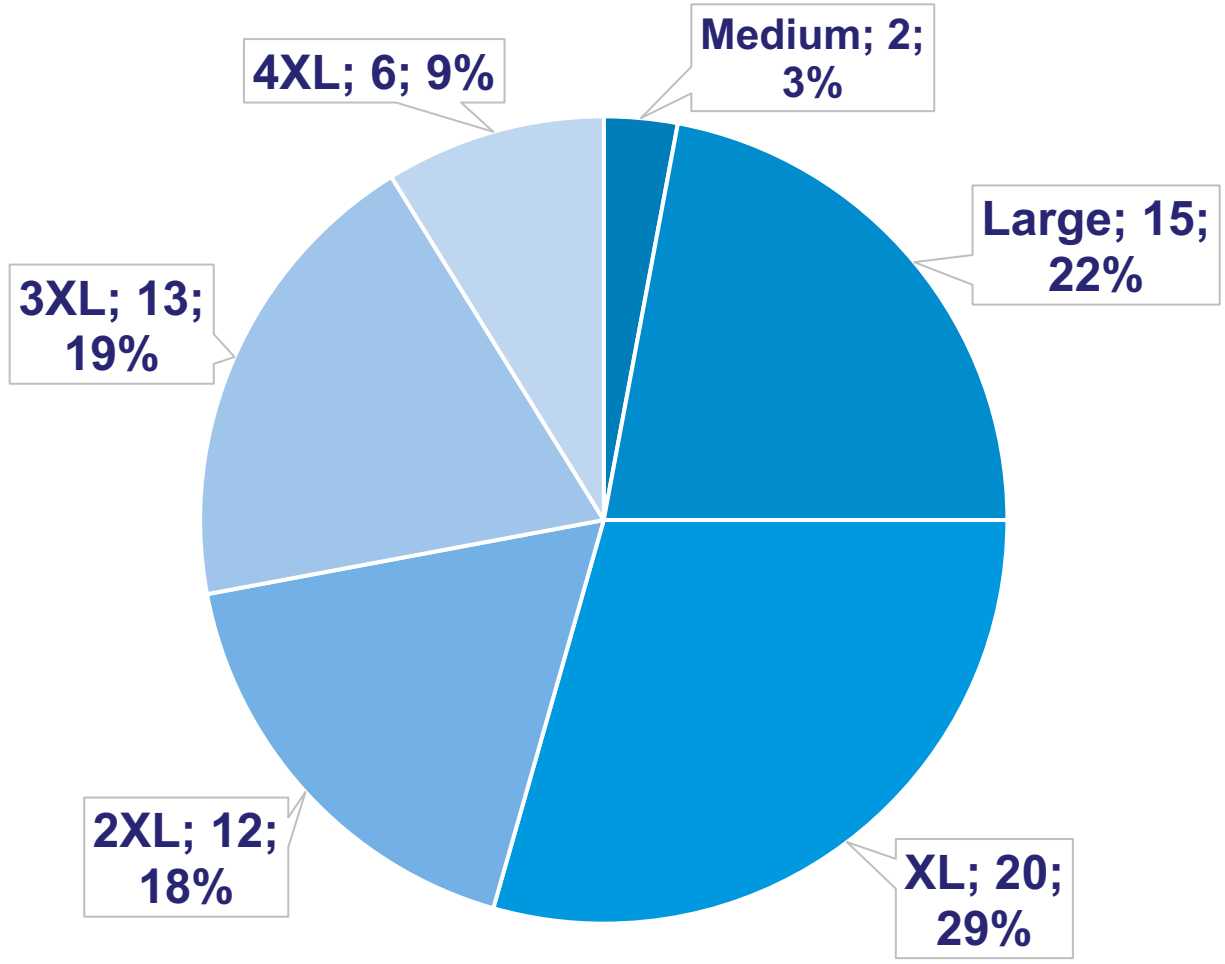
The removal efficiency is determined based on the total effluent (after post treatment) in comparison with WWTP influent

Applicability on WWTP's NL

Product range MicroForce^{++}

Size MF^{++}	I.E.	Flow (m^3/h)
Small	36.000	375
Medium	72.000	750
Large	140.000	1.500
XL	216.000	2.250
2XL	288.000	3.000
3XL	576.000	6.000
4XL	1.080.000	11.250

Distribution MicroForce^{++} on hotspot locations (68 WWTP's)



Take-Home MicroForce^{++}

- **Excellent performance on CO_2 footprint & TCO**
- **Removal efficiency OMP > 85% @ 0,3 – 0,4 g O_3/ g DOC**
- **Modularity enables high applicability on WWTP's in NL**
- **Future research**
  - Scaling up to pilot on WWTP in NL (2022)
  - LCA study (KWR)

Thank you for your attention!

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Tackling Micropollutants in Wastewater
Approaches on Implementation and Innovation in Europe and The Netherlands

November 3 and 4 2021
Aquatech Amsterdam

Rijkswaterstaat
Ministry of Infrastructure and Water Management