



Desai-Zimmerman Fluidic Oscillator (DZFO)

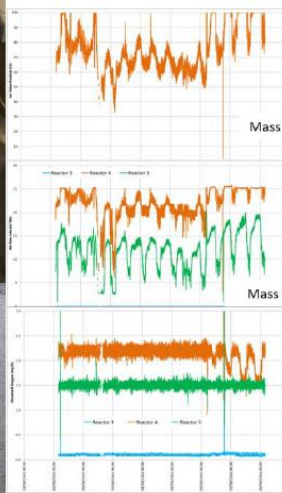
- Low oscillation onset – good turn down
- Frequency virtually independent of flow rate
- Low frequency dispersion
- Lower friction losses than TZFO
- Asymmetric loading possible

Hammarby Sjöstadsverk, Stockholm, Sweden

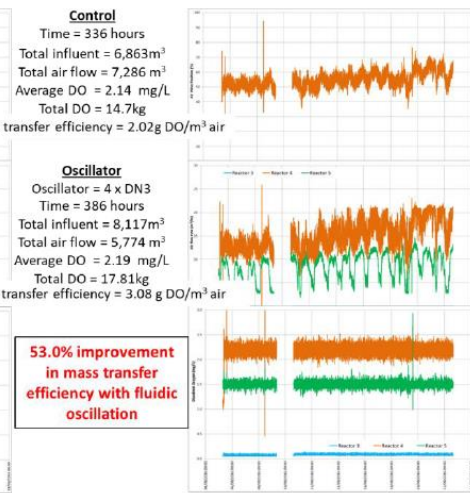


- Fully operational pilot plant
- Inlet from taken from Stockholm Water's Henriksdal WwTW (1:3600 scale) – 1L/s
- Reactor 4 retrofitted with 4x DN9.5 DZFOs and 8x9" EPDM disc diffusers
- Capacity = 40m³/hr
- **53% improvement in mass transfer**

Control



Fluidic oscillator



53.0% improvement in mass transfer efficiency with fluidic oscillation

Bristol, UK



Installation Details

- Fully operational plant
- FTFT – 250 L/s
- DZFO installed between two basins to feed all 4 ASPs
- Normal operation ongoing

Oscillator Details

- DN250
- Materials of construction – acetal, stainless, EPDM (265kg)
- Capacity = 2,400m³/hr (suction air flow)

Mass Transfer - $\alpha k_L a$

- Mixed liquors
- 2,400m³/hr (suction air flow)
- 90% increase in $\alpha k_L a$ (Control=2.36h⁻¹, Oscillator 4.48h⁻¹)
- 7.6% (50mBar) increase in P (P_{Control}=660mBar, P_{Oscillator}=710mBar)

Mass Transfer – Normal Operation

- Set points
- DO = 1.1mg/L (zone 2), 0.9mg/L (zone 3)
- Pressure = 660mBar
- Pre-installation (127 days)
 - Daily inlet flow = 69.1L/s
 - Average blower power = 51.5kW/h
- Post-installation (124 days)
 - Daily inlet flow = 72.8 L/s
 - Average blower power = 42.1kW/h

- **5.5% increase in inlet flow**
- **18.2% blower power reduction**

Contact

info@perlemax.com

Kroto Innovation Centre
318 Broad Lane
Sheffield S3 7HQ