New facility for membrane fouling investigations under customisable hydrodynamics: validation and preliminary experiments with pulsating cross-flow

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Supporting Information

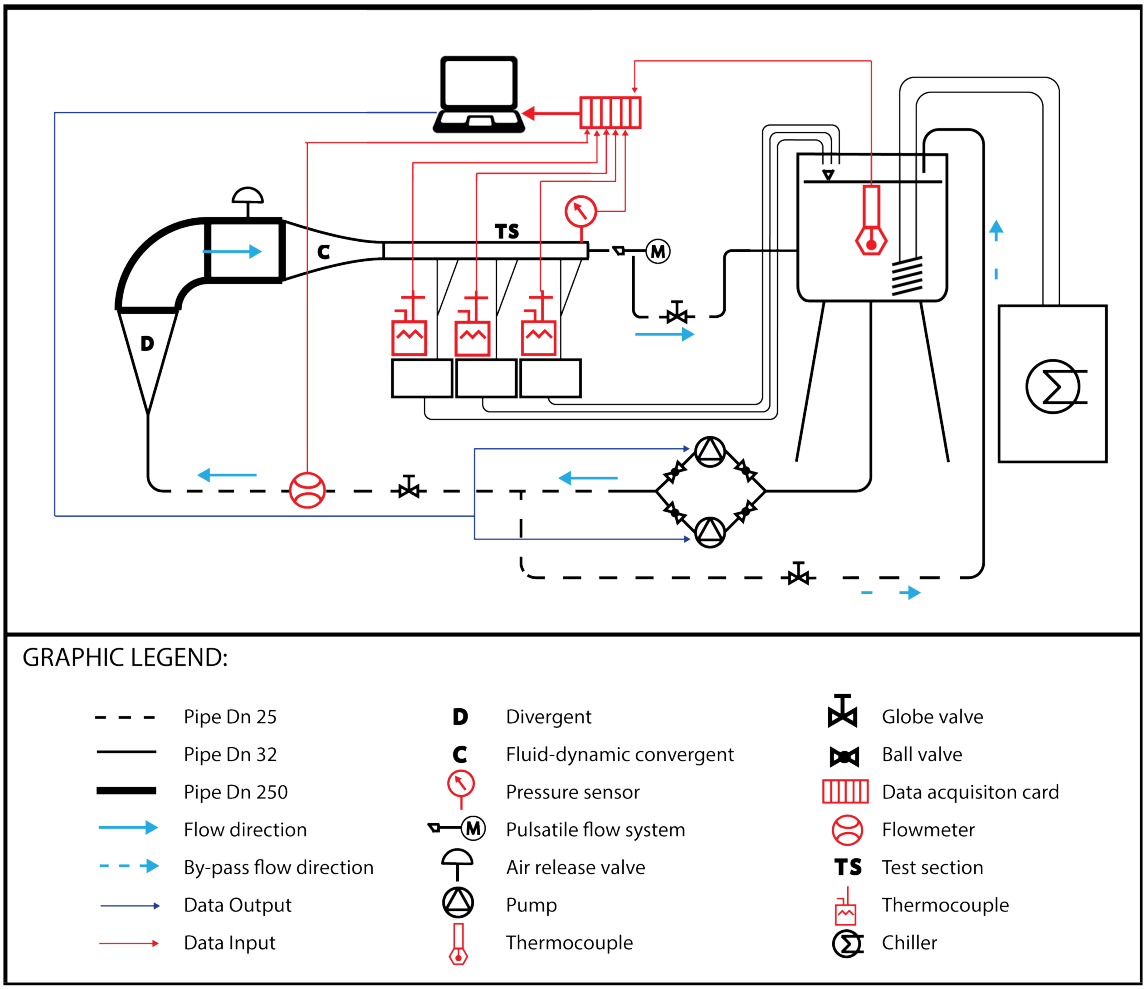

Figure S1: Pipes and instrumentation diagram (i.e. $P\&ID$ Diagram) of the overall facility.

Table S1: Geometries and properties of the main hydraulic components.

Pipes			
DN	PN	ϕ_{est} [mm]	ϕ_{int} [mm]
25	16	26.9	22.9
32	16	42.4	38.4
250	16	273	267

Pumps							
Type	Power [kW]	Q_{min} [l/s]	H_{max} [m]	$Q_{70\%}$ [l/s]	$H_{Q_{70\%}}$ [m]	Q_{max} [l/s]	H_{min} [m]
Lowara - 5SV05	0.75	0.67	36.4	1.67	28.2	2.35	17.1
Lowara - 5SV23	4	0.67	168.9	1.67	129.6	2.35	78.2

Tanks	
Type	Capacity $[l]$
Main tank	1000
Collecting tanks	15

Test section			
Length L [mm]	Height H [mm]	Width B [mm]	Thickness [mm]
1450	10	200	25

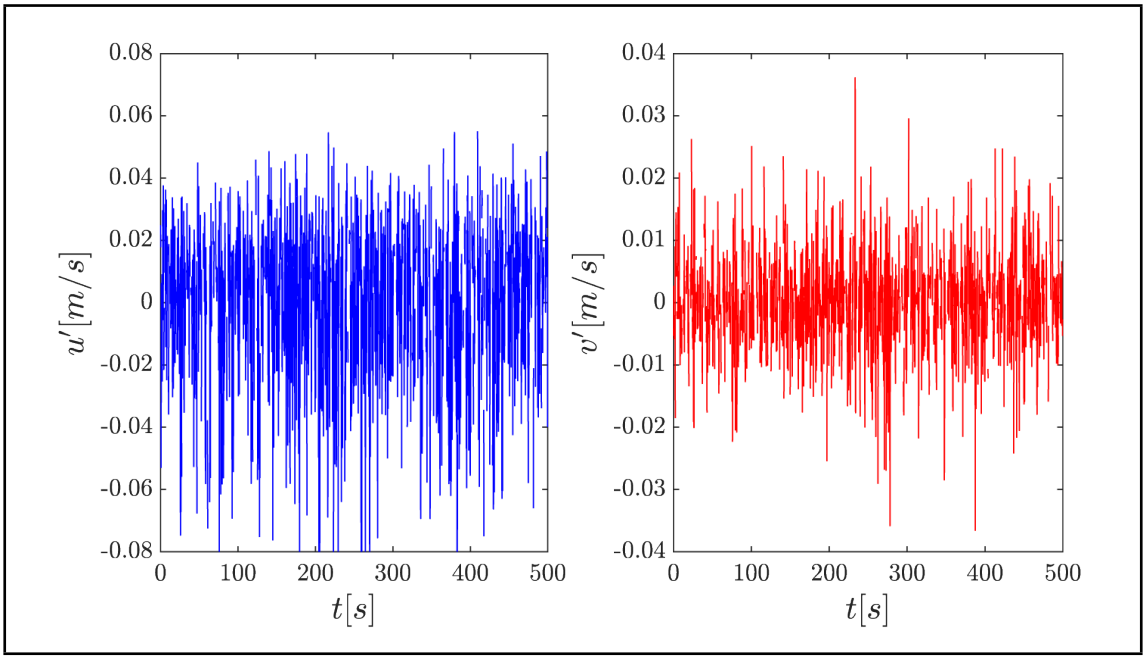

Figure S2: Time series of the longitudinal $u\prime$ and wall-normal $v\prime$ velocity fluctuations deduced by PIV measurement at the position F-2 and coordinates x = 17 mm and y = 2.5.

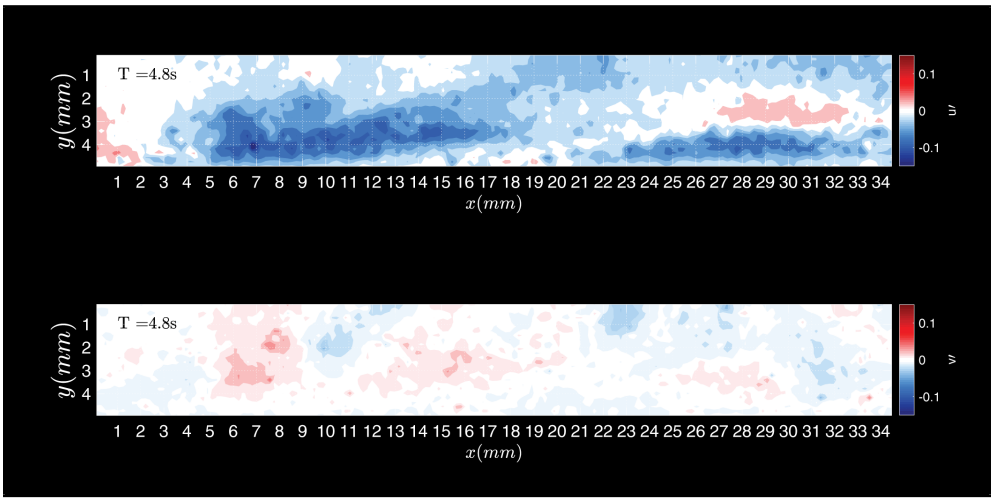

Figure S3: Contour plot of the longitudinal $u\prime$ and wall-normal $v\prime$ velocity fluctuations deduced by PIV measurement at the position F-2 at fixed time T = 4.8 s.

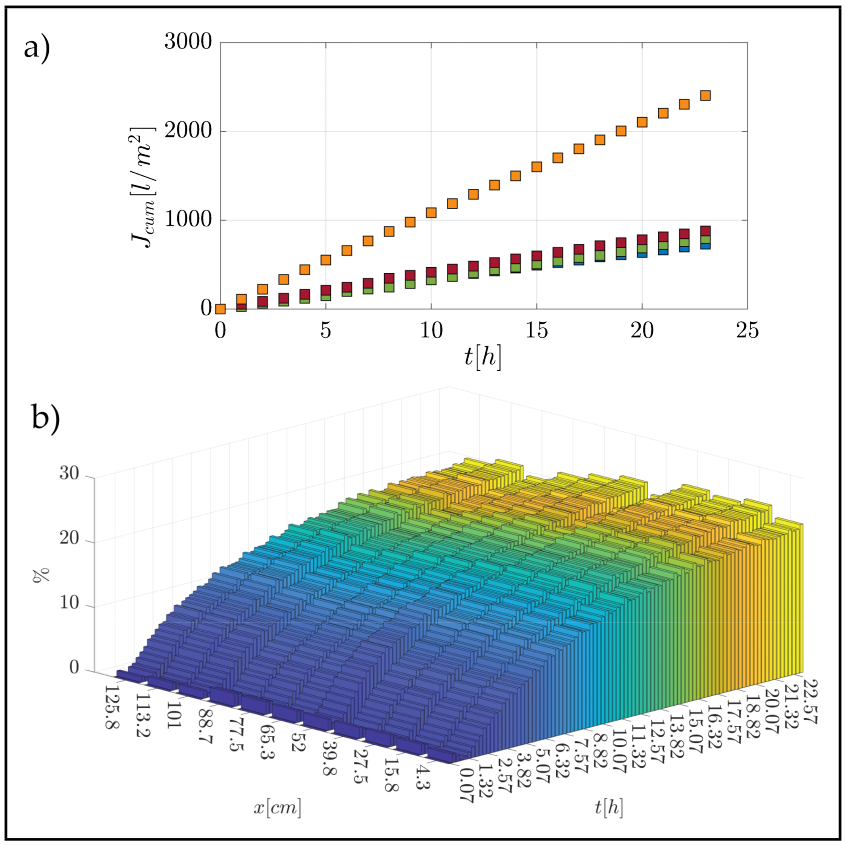

Figure S4: Results of filtration test S - 4.1: (a) Total water flux measured from the individual portions (Where blue, green and red symbols refer to up, mid and down collection tanks respectively and orange squares refer to the cumulative flux) and (b) percentage variation of the membrane colour (yellow band) measured at different longitudinal positions along the membrane surface.