Investigating the Flow Conditioners Working Regimes Efficiency Using Numerical Simulations

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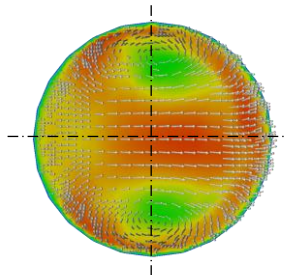
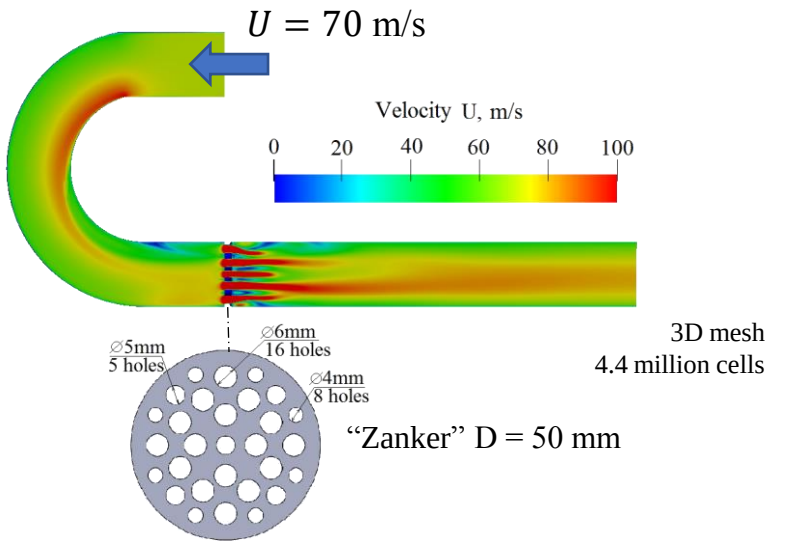
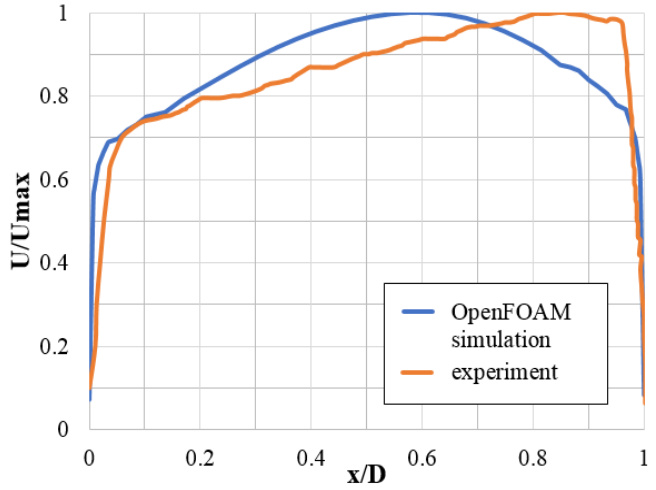
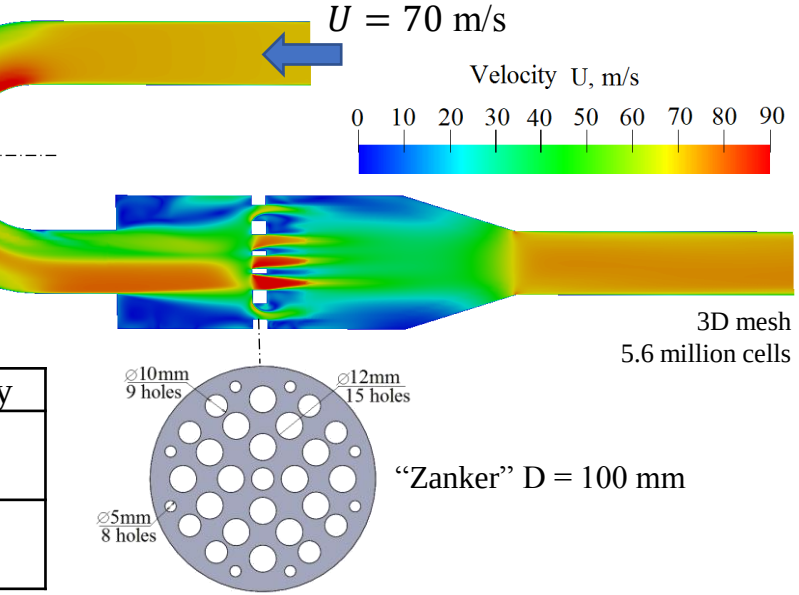
AIR
density $\rho = 1.1839$ kg/m^3
kinematic viscosity $\nu = 13.6{*}10^{-6}$ m^2/s
wall roughness - 10 microns
initial turbulence level - 5%

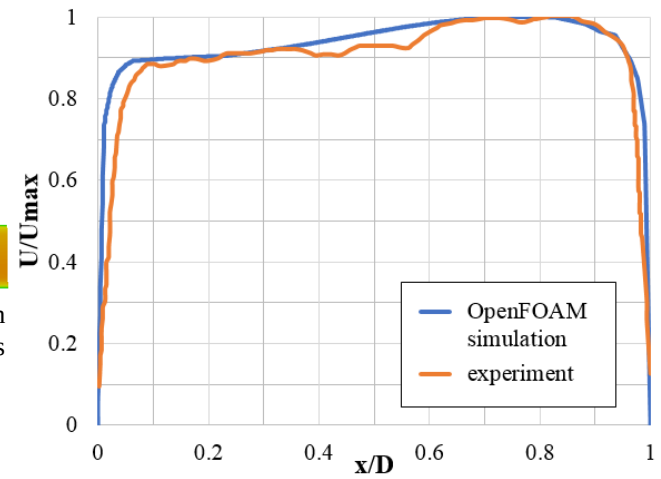






Uniform velocity distribution after flow conditioner inside a straight pipe





Uniform velocity distribution after flow conditioner inside a step pipe

FLOW UNIFORMITY COEFFICIENT $\xi = {}^{U_{aver}}/_{U_{max}}$

	OpenFOAM	Experiment	Inaccuracy
Flow conditioner inside a straight pipe	0.87 (3.8 h on 8 cores)	0.82	6%
Flow conditioner inside a step pipe	0.93 (10.1 h on 8 cores)	0.92	1%