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Visualization of Mixing of Flow in Circular Tubes with Segmental Baffles

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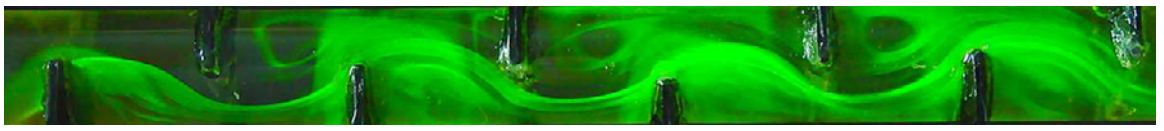
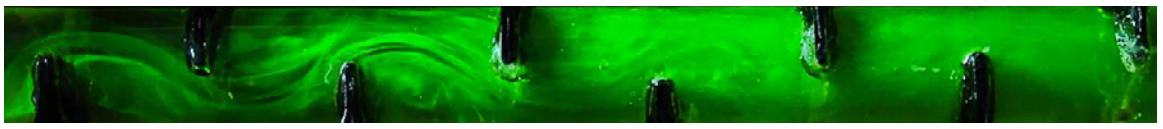
Re = 75



Re = 100

Re = 150

Re = 200



Re = 250

Fig. 1. Flow of water in a circular tube with segmental baffles. The flow is from left to right and the Reynolds numbers' values are based on the unobstructed tube diameter ($Re = \rho VD/\mu$).

Flow of liquids in circular tubes with segmental baffles is encountered in many fluid devices such as heat exchangers, mixers and biological flow models. Figure 1 above depicts laminar flow, visualized by Fluorescen dye, in a pipe (D = 21.5 mm) with eight equi-spaced semi-circular baffles. The baffles induce turbulence- like flow from Re_D>200 as evidenced by the enhanced mixing of the fluid downstream of the pipe.