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Effect of orifice eccentricity on the Vortex size downstream orifice cascade in laminar duct flow AHMED ABOU EL-AZM ALY, MOHAMED METWALLY, HOSSAM ABDEL KADER, Military Technical College, Cairo, Egypt — Vortex formation and shedding downstream obstructions may be assumed to be one of the main sources of induced vibration and noise in pipes. The vortex size may be estimated from its reattachment length downstream these obstructions. Here, vortex formation downstream orifice cascade in a laminar duct flow has been investigated numerically. The vortex reattachment length downstream the second orifice and the circulation have been studied for different geometry parameters; orifice eccentricity, orifice to duct height ratio and orifice cascade interdistance. The results showed an optimum value (minimum vortex size) is a function of duct geometry and orifice to duct height, a correlation function has been deduced to illustrate this relation. The results showed that the control of these parameters may be of special interest, to reduce the generated vortex size.

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