

Thesis Title Two Dimensional Numerical Model of Flow in a Compliant Tube

Author Mr.Somjitr Hachanont

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Thesis Advisor Asst.prof.Dr.Yottana Khunatorn

Abstract

The objective of this research was to study the behavior of fluid flow in compliant tubes with steady flow. According to the parameters of fluid flow, it was concerned about changing of pressure, velocity, dimension and stress of compliance tubes. The solutions of Numerical model were compared with the experiment solutions. And vary flow rate frequency and young modulus for oscillatory flow in case study. In this research, it was found that, The deformation of compliant tube depend on young modulus. increase young modulus deformation will decrease. It has maximum velocity profile in center line and decrease until zero at the wall. At the height frequency or height pressure were height shear stress too. Numerical modeling of flow in a compliant tube agree well with experimental results. The experimental have maximum error 15-20%. In oscillatory case, pressure gradient forward velocity gradient about 45° because of fluid inertia and increasing radial velocity frequency will decrease. Velocity almost zero at height pressure frequency that has no flow in compliant tube. Other hand, fluid flow look like steady flow at low pressure frequency.