Abstract

In the paper we study a problem on free vibrations of liquid-filled cylindrical shells strengthened by longitudinal regularly located ribs and loaded with axial contracting forces.

Using the equations of motion of structurally orthotropic shell, liquid and contact conditions of permeability, we get a frequency equation for finding eigen frequencies of vibrations of liquid-filled shell loaded with axial contracting forces and strengthened by longitudinal ribs. Influence of physical and mechanical parameters of ribs and liquid on the frequency of eigen-vibrations of the considered construction are researched. Simplified formulae for calculating eigen frequencies of the vibrations of the considered system are obtained on the basis of the asymptotic method.