

Abstract

In the paper we investigate a problem on free vibrations of liquid-filled cylindrical shells that are regularly reinforced by transversally located ribs and loaded with axial contracting forces. Such kind problem, when there is no liquid, was investigated in the paper [1]. In the paper [2] a problem on vibrations of stiffened liquid-filled cylindrical shells without axial contracting forces was researched.

Using the motion equations of structurally-orthotropic shell, liquid and contact proofness conditions we obtain a frequency equation for finding eigen frequencies of vibrations of a shell reinforced by transverse ribs and loaded with axial contracting forces. The influences of physical and mechanical parameters of ribs and liquid on frequency eigen vibrations of the considered construction are studied. Simplified formulae for calculating eigen frequencies of vibrations of the considered system are obtained on the base of asymptotic method.