

Chutima Sakchinbud 2013: An Investigation of Stiffness for Rubber Track.
Master of Engineering (Mechanical Engineering), Major Field: Mechanical
Engineering, Department of Mechanical Engineering. Thesis Advisor:
Assistant Professor Supasit Rodkwan, Ph.D. 144 pages.

This research aims to compare the stiffness of rubber track obtained by ways of laboratory experiment and numerical analysis. The rubber track tested in laboratory was subjected to static compressive load using universal testing machine whereas three-dimensional finite element (FE) technique was used for the numerical analysis. The material properties assigned in the FE model were based on the three tests of rubber samples which are biaxial test, compression test, and planar shear test. The raw data from the test was used to predict the hyper-elastic model. In this study, five different hyper-elastic model, i.e. first order Ogden, second order Ogden, third order Ogden, two terms Mooney-Revlin, and three term Moony-Revlin, were calculated. According to the experiment, it can be observed that the first order Ogden produced the FE results close to the experimental result. The stiffness obtained by means of experiments and FE analysis were 5,690 kN/mm and 8,276 kN/mm, respectively. The difference between both values was approximately 18 percents. In addition, total strain energy density and von Mises stress results in FE analysis is concentrated around the edge of rubber track.

Student's signature

Thesis Advisor's signature