

Designing of Rubber Based Strain Sensor as a Vehicle Tyre Performance Indicator

S. Vinoshan; B.Kobika; V.S.C. Weragoda*

Department of Material Science and Engineering, University of Moratuwa, Sri Lanka

**Email: sampathw@uom.lk*

For the development of strain sensor to measure the uneven deformation in the vehicle tyres, so that to improve the safety of the vehicles and self-driving cars. the design of elastomeric strain sensor fulfils the requirement of tyre properties change during application. Rubber strain sensor works like piezoresistive material because electric properties change while change the strain of the subject. Therefore, elastomeric strain sensor composition with rubber composites based on natural rubber and electric conductive filler such as carbon black and carbon nanotube have been studied and used for work like as piezoresistive. Develop the strain sensor as its performance does not lose while dynamic load application. The carbon black filler network composition changes during applied load. The rearrangement of the filler network happens while realizing the load. Considering crosslink density and stiffness that affect the performance of sensor composition was selected because lower crosslink density make mobility of filler network so is improve the electric properties. Suggestion on develop a circuit for detect the sensor resistance variation and mount in the vehicle tyre was done. The analysis data transfer to the vehicle electronic system for identify what are issues such as road condition, improper tyre pressure, tyre vibration level and steering angle. Then according to the information vehicles can make warning to the driver and make safety improvement.

Keywords: Strain sensor, Conductive rubber, Automotive tires