An Experiment of Thick Film Force Sensor Using MEMS Simulation Software.

ABSTRACT

Force sensor (or pressure sensor) has gained increasing interest among the researchers. Using the Microelectromechanical Systems or MEMS technology, the size of the force sensor can be miniaturized and this ignites more possible application in the field of biomedical and robotic applications. Recent researches show the application of force sensor on the prosthetic hand, an artificial limb connected to an amputated person. This paper presents on simulating the sensitivity of the thick film force sensor using IntelliSuite software. The force sensor is realized by using the piezoresistive material on the cantilever structure. There are three force sensor designs are simulated. Two of the designs are simulated using glass as substrate, and while the remaining one is of alumina substrate. The sensitivity simulated is much smaller compared to the estimations made using equations. The simulations show that the glass sensor fares better than the alumina sensor. If the substrate is the same, the sensor with the bigger dimension has better sensitivity.

Keyword: MEMS; Force sensor; IntelliSuite; Piezoresistors; Piezoresistive coefficient