

## Innovation and Analysis of Vibrating Fork Level Switch

**Authors :** Kuen-Ming Shu, Cheng-Yu Chen

**Abstract :** A vibrating-fork sensor can measure the level height of solids and liquids and operates according to the principle that vibrations created by piezoelectric ceramics are transmitted to the vibrating fork, which produces resonance. When the vibrating fork touches an object, its resonance frequency changes and produces a signal that returns to a controller for immediate adjustment, so as to effectively monitor raw material loading. The design of the vibrating fork in a vibrating-fork material sensor is crucial. In this paper, ANSYS finite element analysis software is used to perform modal analysis on the vibrations of the vibrating fork. In addition, to design and produce a superior vibrating fork, the dimensions and welding shape of the vibrating fork are compared in a simulation performed using the Taguchi method.

**Keywords :** vibrating fork, piezoelectric ceramics, sound wave, ANSYS, Taguchi method, modal analysis

**Conference Title :** ICMP 2016 : International Conference on Manufacturing Processes

**Conference Location :** Seattle, United States

**Conference Dates :** August 08-09, 2016