Using Piezoelectronics to Convert Energy from a Nontraditional Source: Vibration

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This project was done to test which piezo element most efficiently converted the energy from a vibrational source. It was hypothesized that the V22B piezo element, with its superior design structure, would have a greater power output across a resistive load at varying vibrational frequencies than the 0-1005447-1, 1005939-1, and 0-1002794-0 piezo elements. To test this hypothesis, the four piezo elements were obtained and attached on the perimeter of a circular piece of wood. The vibrational source was attached in the center of the circle to evenly distribute the vibrations. Each trial tested the piezo elements at frequencies from fifteen hertz to fifty hertz at intervals of five. This trial was done five times to insure accuracy. The V22B piezo element had the highest output across the entire frequency range. The V22B performed in a class of its own, but the other piezo elements were more comparable. The 0-1005447-1 piezo element performed the next best, which made it better than the 1005939-1 and 0-1002794-0. The 1005939-1 performed better than the other two comparable boards at low frequencies because it is designed for that range. The 1005939-1 performed the third best overall, which is better than the 0-1002794-0. The 0-1002794-0 was similar in design to the 0-1005447-1, except that the 0-1005447-1 had a weight attached to the tip which helped it perform better than the 0-1002794-0 piezo element.

Awards Won:

Third Award of $1,000