

Aidan Mike

Junior Division Physics

Electro-Flow

This project was designed to determine if and how temperature affects the flow (resistance/conductivity) of electrical current. Three different types of wire the same length and gauge (steel, copper and brass, 100 feet long, 24 gauge) were wrapped around plywood “spools” to prevent short-circuiting. Each spool was subjected to temperature extremes of dry ice (-107 degrees F), room temperature (68 degrees F) and oven (400 degrees F). A multi-meter was used to measure the conductivity/resistance for each type of wire in each of the three conditions. It was observed that the steel alloy exhibited the greatest variance due to temperature difference (12.8 Ohms resistance), the brass exhibited the second greatest variance (3.0 Ohms resistance) and the copper exhibited the least variance (2.1 Ohms resistance). The test results and analysis of the data indicate that the cold temperature boosted the conductive qualities of the wires tested. The hotter temperatures produced greater resistance in all the materials. The data also showed that copper was the superior conductor under all conditions, brass was the second-best conductor and steel had the least conductive qualities.