Armstrong Ceiling Tile Sales Demonstrator

Overview
The project objective was to redesign the current “Bell Box” demonstration unit that Armstrong’s ceiling tile salespeople use to persuade customers to buy their product for the added acoustical properties. The current box is big, heavy, and only shows the sound properties in a qualitative matter. The new box should show the light reflectance properties and the sound properties in a quantitative as well as a qualitative manner.

Objectives
- Qualitatively and quantitatively display test results
- Demonstrate sound absorption, transmission, and light reflectance properties
- Lightweight, portable, durable design
- Easy to understand results
- Simple testing procedure

Approach
- Customer needs were gathered from both our Armstrong contact person and an Armstrong sales representative during the team’s visit to Armstrong’s corporate headquarters
- Each team member generated one design concept, and the best concept was chosen by using a Pugh chart
- The chosen design was the diagonal orientation concept
- Patents were researched in Asia, Europe, and North America, but no existing patents were found for this unit.
- A replica of the bell box and an alpha prototype of the chosen design were built to test the material properties
- Solidworks models of the chosen design were generated
- Both PSU and SJTU built an alpha prototype to test the Arduino processor and readout, and PSU built a beta prototype
- Sound absorption, sound transmission, and light reflectance tests were performed using the beta prototype for two Armstrong products and three competing products
- Both qualitative sound results and quantitative results were produced. The quantitative results were in the form of a voltage readout

Outcomes
- The salespeople can now show both qualitative and quantitative sound results to potential customers
- The salespeople can now demonstrate light reflectance properties to potential customers
- The demonstrator is lightweight and portable so the salespeople can easily transport it to sales calls
- The demonstrator costs about $280 to produce