The Effect of Varying Micro-Perforated Acoustical Tape on the Sound Intensity of a HVAC System Using a Scale Model and Two and Three Dimensional Modeling Software

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Engineering goal one was to use galvanized metal and acoustical dampening tape to create an accurate scale model of the HVAC. Engineering goal two was to use data collected with the replica to modify the HVAC to lower the sound intensity emitted. Both engineering goals were attained. The question for this experiment was; What effect do different amounts of acoustical tape implemented on an HVAC have on the sound intensity emitted? I hypothesized, If an acoustical tape provides more coverage, it will lower the sound intensity emitted. Initially, ten data points were taken from ten different locations in the art room. This data was compared to data collected using a two dimensional model (MASEV) as well as a three dimensional model (EASE). Next four 24” long sheets of galvanized metal were purchased and used to create ducts. Additionally, four elbows were also purchased. These two items were used to create a scale model of the HVAC. Finally, on one end a four inch wide diffuser was placed. Then, the tape was taped in the inside, outside, bilaterally, vertically, horizontally, and with insulation to see which method would dampen the most sound. Once the data was analyzed, it was deemed the outer tape application was the most beneficial. The outside of the actual HVAC was then covered with tape. Again the data was collected in the actual room and depicted the decibel levels had decreased with application of the tape.

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