

HVAC design using SolidWorks design tables.

Erin Garvey k00255441

Aim of the Project

The Aim of the project is to generate 3D modelling of a commonly used HVAC component in the Solid works Software, then I use the SolidWorks design tables feature to generate configurations of the components and establish an interface with an Excel based Calculations that modify the component due to demand specifications.

Objectives

- Developing 3D geometrical model of the different HVAC components in Solid works.
- Perform Design Calculations in MS EXCEL and link the design values of vital dimensions of the components calculated in Excel to Solid works Design Table.
- This interface link can enable 3D modelling of different HVAC components for its range in liaison with the Design Calculation performed in MS Excel at a quicker rate.
- Demonstrate aspects of Design Tables and the advantages in design of HVAC Components

Acknowledgements

Thanks to Kaushal Shetty and Clodagh Moore for their guidance and help throughout the course of the dissertation.



Literature review

As part of the dissertation we completed a literature review, this was done to see the preexisting study and research done in related fields.

In the literature review, we discussed what is HVAC system modelling, common HVAC Components , the use of ducting in HVAC , the use of BIM and energy performance.

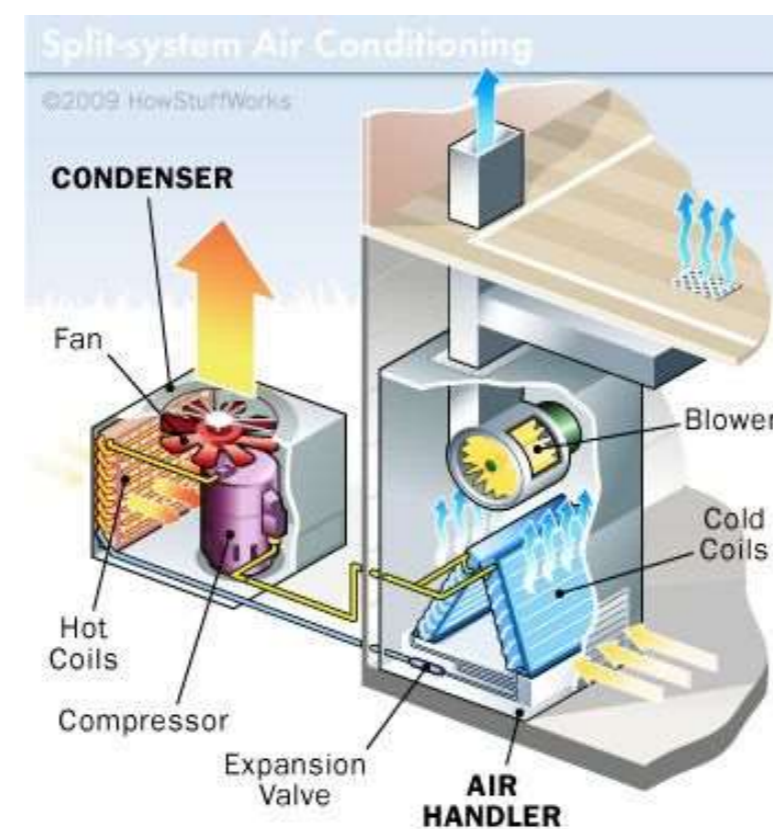


Figure 1 :HVAC system in a building.

Questionnaire

We created an online questionnaire , we sent this out on the social media network LinkedIn, so that relevant people could see it and fill it out to help bridge the gap in our knowledge on the topic.



Figure 2: LinkedIn logo.

Ducting design.

Duct elbow fitting.

We designed a duct elbow as our fitting of choice , we created a 90-degree 180mm duct elbow in SolidWorks to base our design table calculations on. We did this as we knew from our research into the topic fittings such as elbows can change the pressure and velocity of the system thus, they needed to be sized correctly .

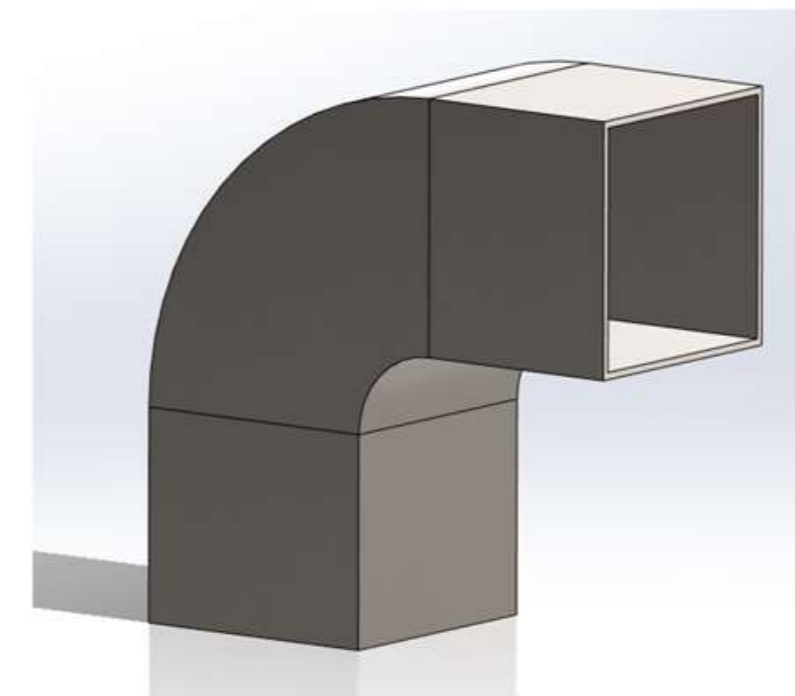


Photo of: 180mm duct elbow

Design table integration

We used the SolidWorks design table function to open an excel sheet in SolidWorks, this gave us the ability to create a working calculator for the pressure drop in the duct elbow , once this calculator was created, we integrated it with the duct elbow model and so we could make configurations to the model relative to the calculated specifications.

This gave us the opportunity to save time in the design and calculation stage and combine them so you could change the same part for different uses.

Conclusion

In conclusion our dissertation was a success, we achieved all the objectives set out at the beginning of the process, we learned about the existing topics and information researched, we learned from people in industry firsthand the usefulness and the current thought process used when designing HVAC systems and ducting . We also created and fully integrated a calculator into SolidWorks design tables to configure existing parts relative to the design specifications.

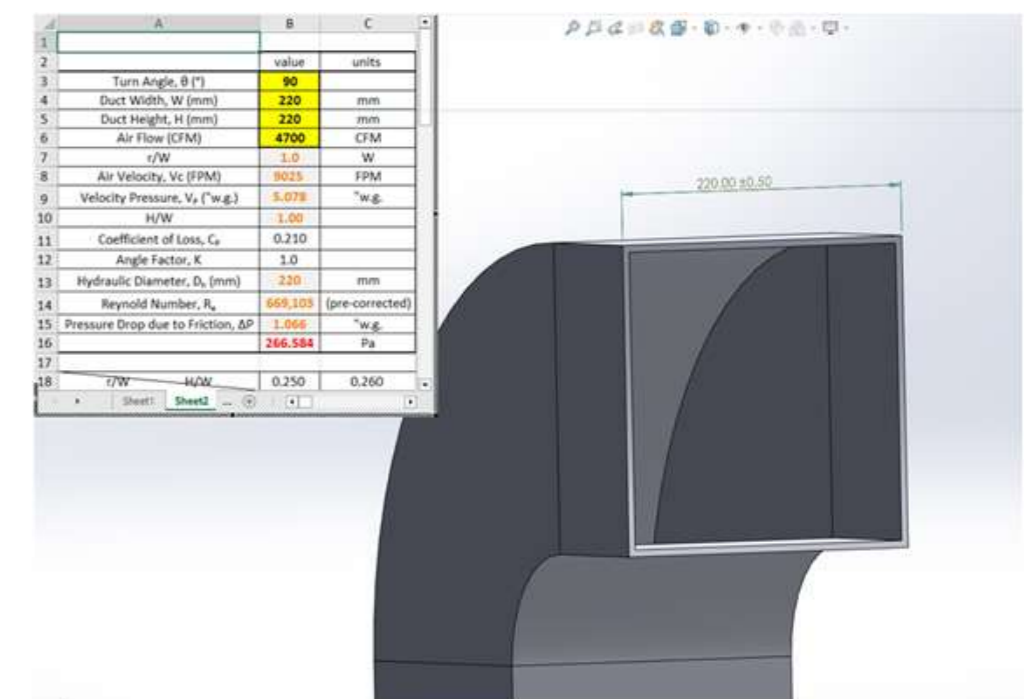


Photo of : duct elbow being configured using design tables calculator.

References

Figure 1- split-system air conditioning. (2009). Howstuffworks.Com

Figure 2-

https://upload.wikimedia.org/wikipedia/commons/0/01/LinkedIn_Logo.svg