

The goal of this workshop is to give students an idea of how Fire Modelling can be used in a real-world engineering problem. For this purpose you will have to design a smoke management system in a building that you would feel comfortable presenting to a relevant authority. The information available to you is geometry of the building, intended use of the building and safety requirements in terms of egress time.

The following steps will guide you through the design process:

1. Before anything else you have to decide what your design fire will look like. Your fire should reflect a 'reasonable worst case scenario', i.e. it should be the worst case that you think is likely to happen. Create your design fire based on information provided in the course material (CIBSE Guide E). Remember, there is no single answer. Whatever you decide is acceptable, as long as you can defend your design criteria.
2. Define the fire location. Again, this should be a 'reasonable worst case scenario'.
3. Calculate the smoke volume and smoke temperature that result from your fire using empirical correlations. With this information you would be able to size your exhaust system, and to give specifications regarding maximum temperature the fans must be able to resist.
4. Build your CFD model. Create the geometry, implement your design fire and place the vents in locations that you think are reasonable in order to efficiently extract the smoke. Use the previously obtained information to size the ventilation points.
5. Run the model, and analyse the results.