The significantly less computational effort of the coarse grid approach in the FluidDynamics Library makes it possible to conduct several simulations with the aim of optimization of e.g. necessary volume flow rates even with medium tier hardware. With this advantage the FluidDynamic Library can be used to plan, size and optimize smoke extraction systems in less time and with significantly lower costs than with detailed CFD tools and several iteration loops. In the process of approving a building permission this can cause a noticeable speed-up and also a significant reduction of costs due to the fact that the amount of necessary expensive CFD simulations can be limited to one single loop in the best case.

References

[VDI(2009)] *Engineering methods for the dimensioning of systems for the removal of smoke from buildings*. Verein Deutscher Ingenieure, 2009.

[MPC(2018)] Mpcci - multiphysics interface, 2018. URL https://www.mpcci.de/.

[TIS(2018)] Tisc suite, 2018. URL https://www.tlk-thermo.com/index.php/en/software-products/tisc-suite.

[Michaelsen(2015)] et al. Michaelsen. Dynamic simulation of an aircraft compartment coupled to a ventilation system. *AST 2015*, 2015.

[Versteeg and Malalasekera(1995)] H. Versteeg and W. Malalasekera. *An introduction to computational fluid dynamics, The finite volume method*. Longman Scientific & Technical, 1995.