

XRG Simulation GmbH

Using simulations to prevent infections

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Overview

For the operation of air-conditioned and ventilated workspaces, an assessment of the risk of virus infection is essential. Effective protection of persons has the highest priority. In addition to personal measures (physical distance, protective masks, etc.), this also includes the spatial design of workplaces, the adaptation of work processes and walking routes and sufficient ventilation of the rooms. But what is sufficient ventilation?

XRG is a leading specialist for ventilation and movement simulations of all kinds since many years. We offer detailed flow simulations (e.g., aerosol simulation), emission simulations and pedestrian flow analyses, which can be used for the investigation and development of optimal infection protection in all spatial environments. Scientific parameters are used as criteria to allow a transparent evaluation.

Detailed flow simulation

Detailed dynamic flow simulations can be used to analyse the distribution of potentially infectious aerosols within any room. In this way, for example, an optimal arrangement of workstations can be found that reduces the risk of infection to a minimum. We use the well-established simulation tools ANSYS Fluent and OpenFoam.

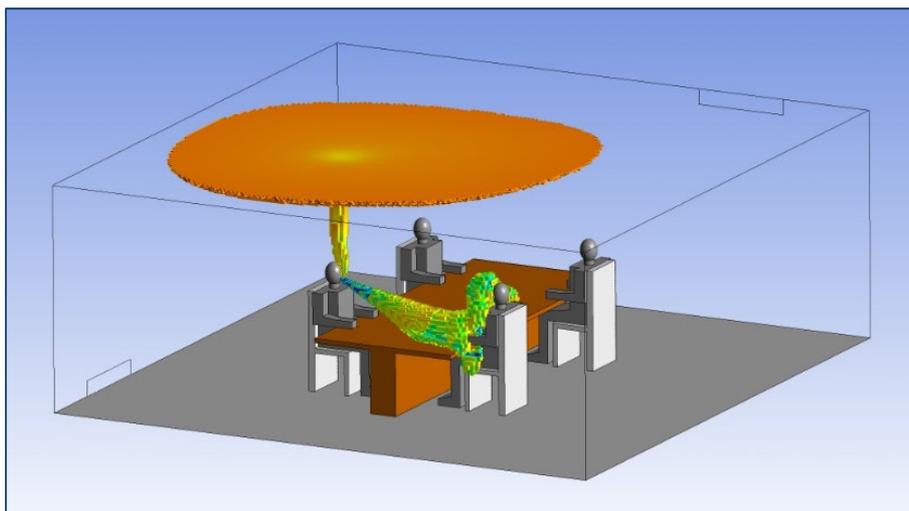


Figure 1: Distribution of aerosols emitted by an infected sneezing person inside a meeting room

Emission analyses

Dynamic room models can be used to optimise the operating mode of a ventilation system in such a way that the risk of infection from room air contaminated with infectious aerosols is minimised. The fast calculating models allow the investigation of a large number of possible scenarios.

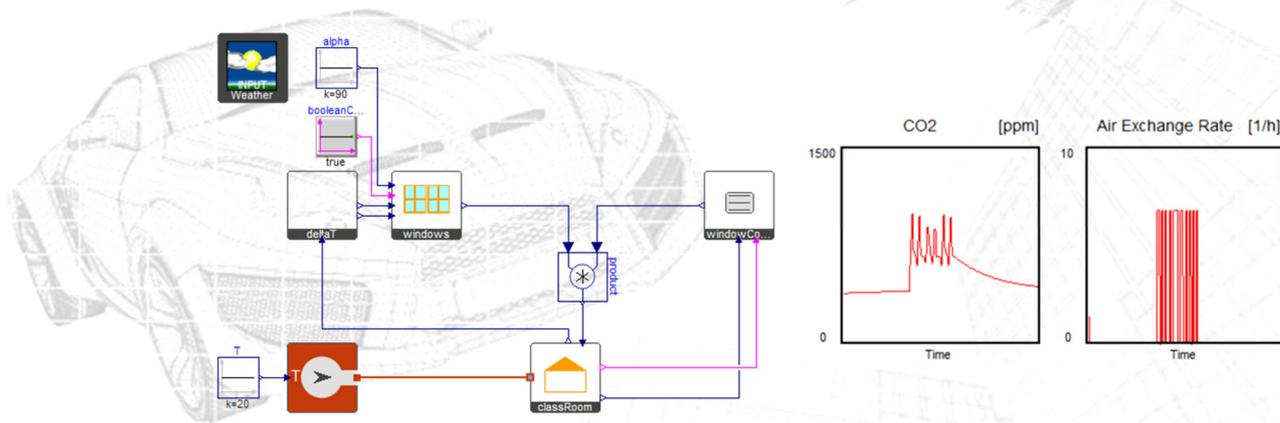


Figure 2 Dynamic room model of a classroom to optimise the ventilation control

Pedestrian flow analyses

XRG has many years of experience in the field of agent-based movement simulation. This simulation method, known from fire protection engineering, can also be used to optimise workflows and to direct person flows in such a way that minimum distances between people can be maintained. In this way, the risk of infection can be significantly reduced. We use the well-known simulation software Pathfinder from Thunderhead Engineering.

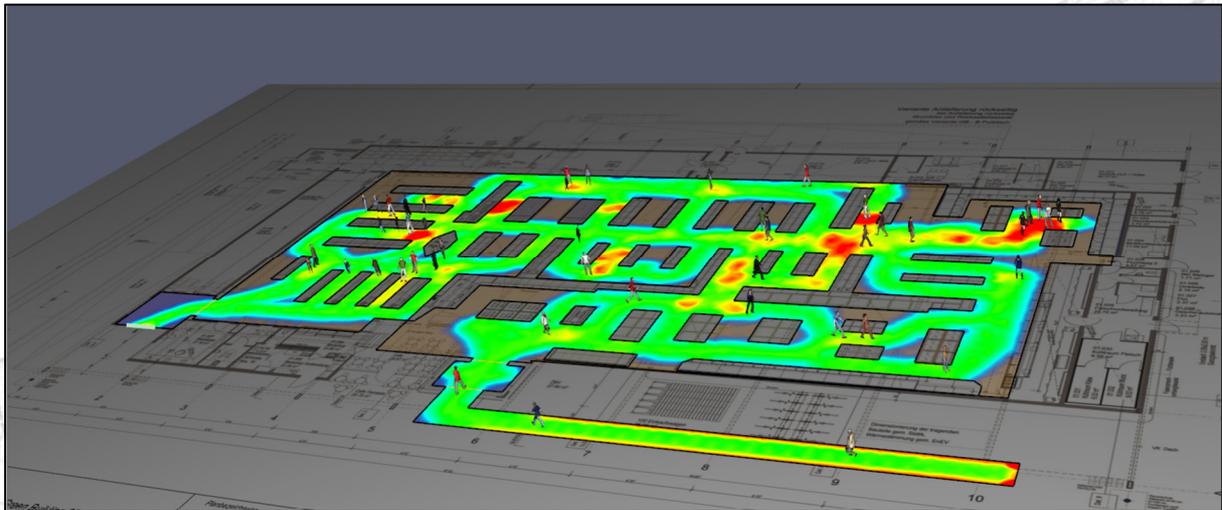


Figure 3 Distribution of persons within a store with partially insufficient minimum distances

Contact

You have a need and interest in one of our services?

Please describe us your questions and send them to info@xrg-simulation.de or give us a call. Tel.: +49 40 766 29 2630.

We are looking forward to your inquiries!