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“Standard Fires in Historic Buildings“ Proposal for a COST C17 – WG2 Research Project

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Overview

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2. Ideas and Procedure
3. Examples
4. Structure of the Final Report

Why simulations for historic buildings?

Historic buildings are unique and complex (arcs, curved ceilings,...)

⇒Difficult to estimate fire, heat and smoke propagation

With simulation we can:

- Estimate the fire behaviour
- Compare different fire protection strategies

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Simulation codes

Type	Description	Advantages
CFD	Fine discretization of space and time	-Accurate in a general sense -Insight in flows
ZM	-Coarse discretization of space -Algebraic equations	Fast setup and run for simple cases

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Ideas

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- Simulation of combustion process is possible in principle
- Currently: Heat release rate is starting point for simulations
- A clear definition of such a HRR is needed
- In general: Which are the fire characteristics that must be included in a simulation?
- Extreme cases should not be included in the definition: arson fires, flash over fires

Procedure

- 2-3 people of WG2 collect the information and write intermediate reports
- Members of WG2 (and some other) should provide information in a compiled form
- Final report in December 2005

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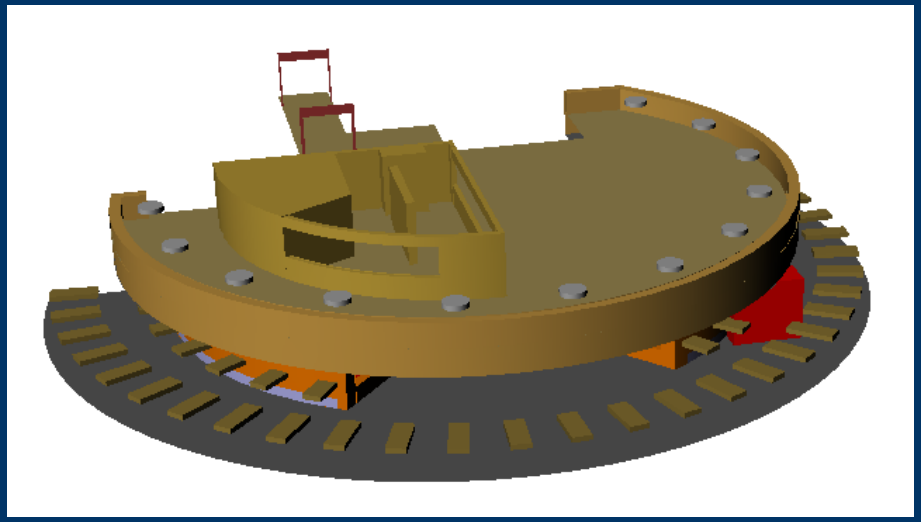
Examples from previous projects

Smoke distribution in a restaurant and cafeteria



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Examples from previous projects

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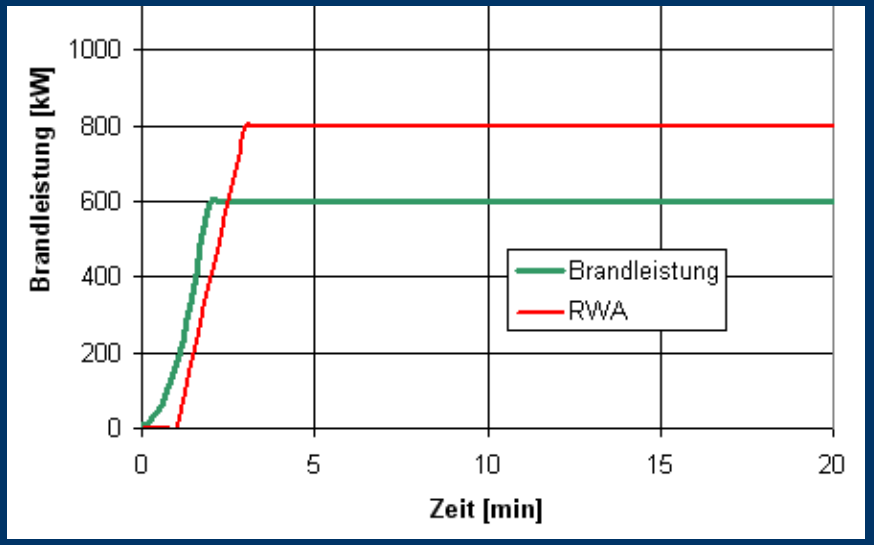
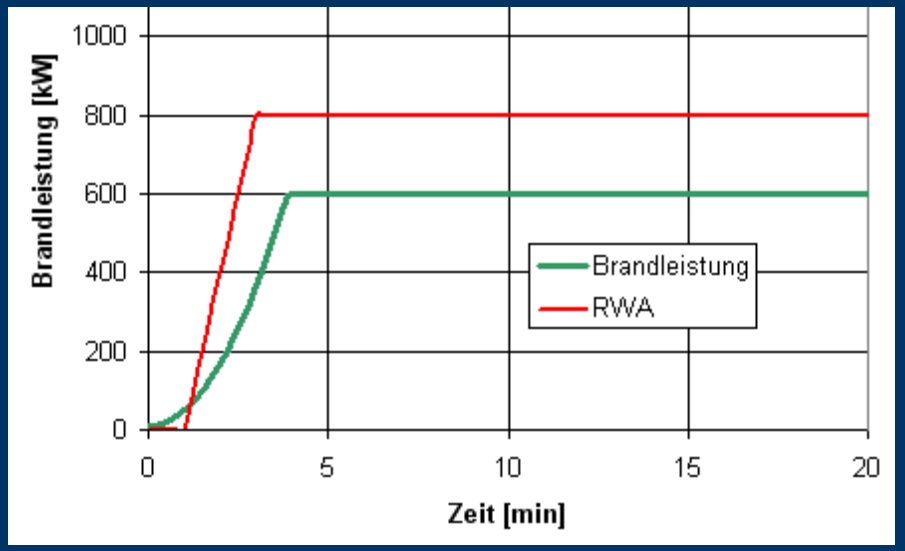
Fire in the kitchen



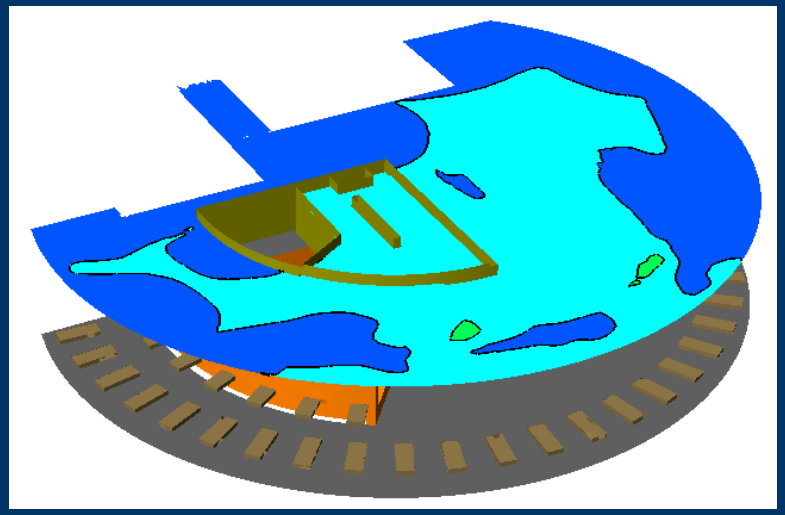
Fire in the customer area (tables)



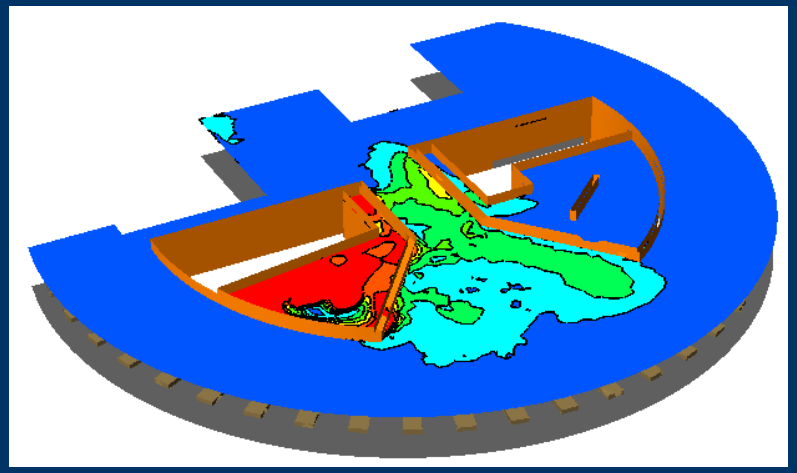
Examples from previous projects

Fire in the kitchen

Smoke concentration
in the cafeteria



Smoke concentration
in the restaurant



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Examples from previous projects

Smoke distribution in a University building in Siena (historic building)

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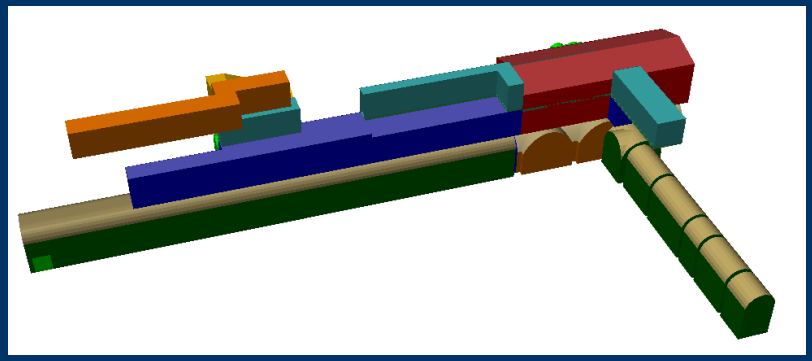

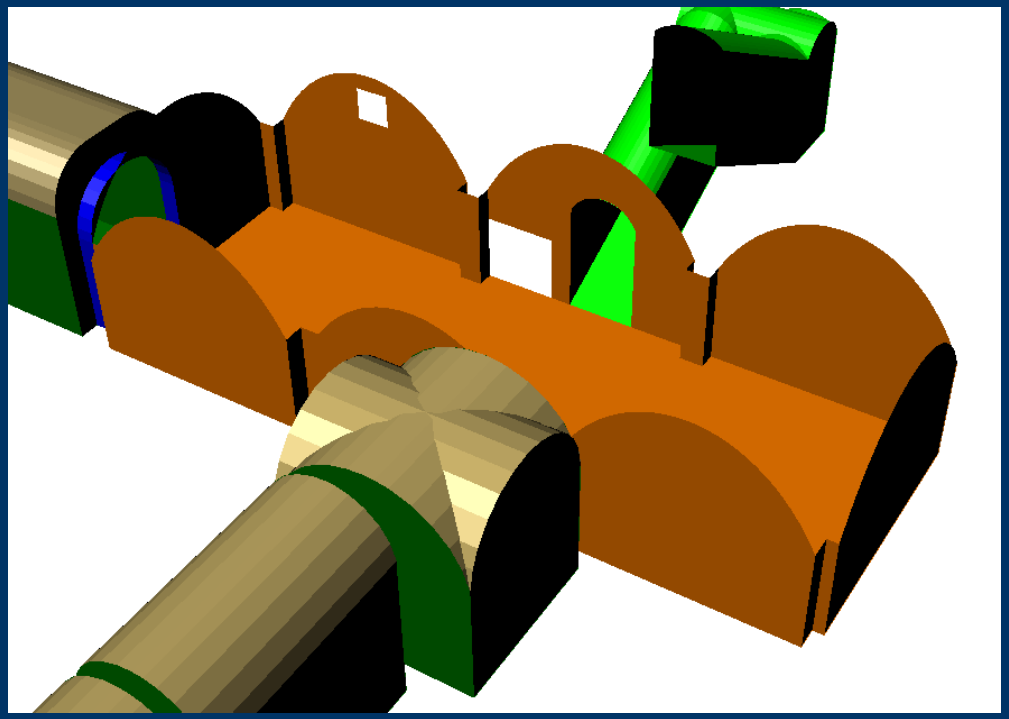

Examples from previous projects

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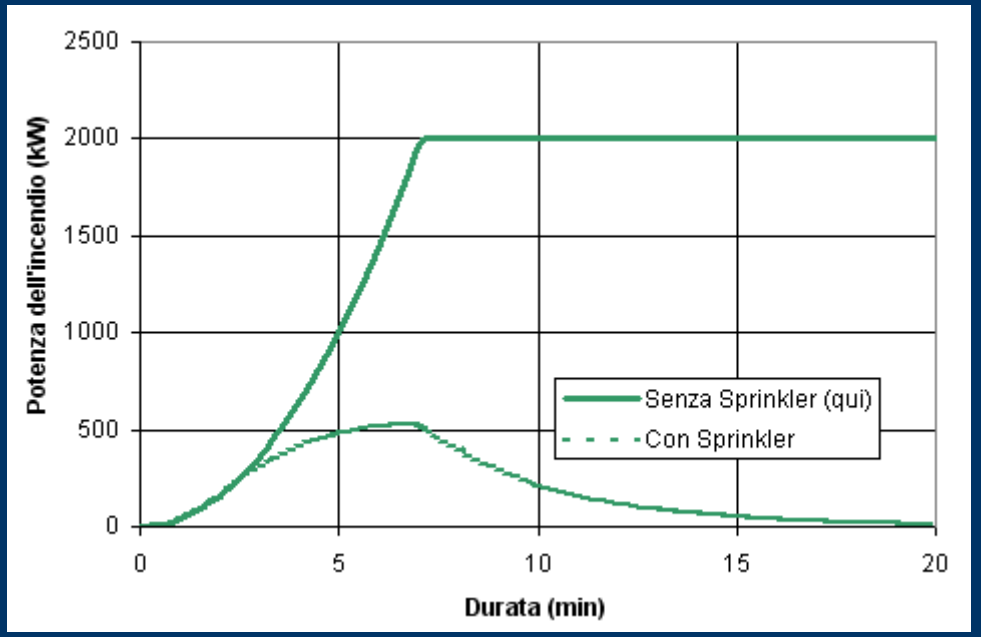
Fire in an office



Examples from previous projects

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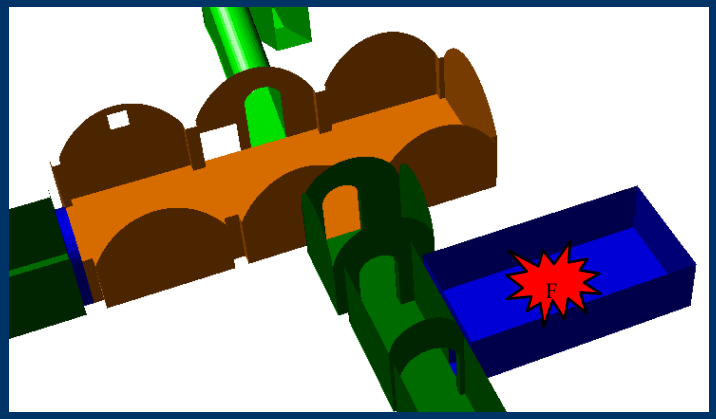
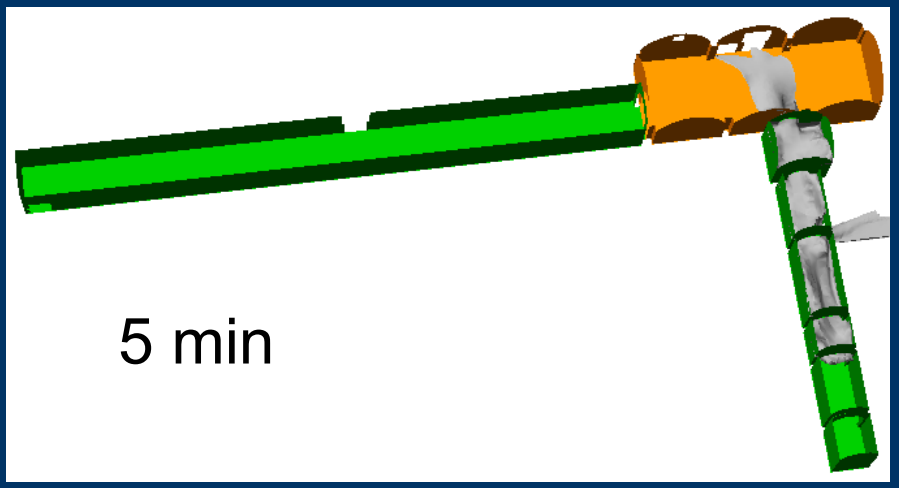
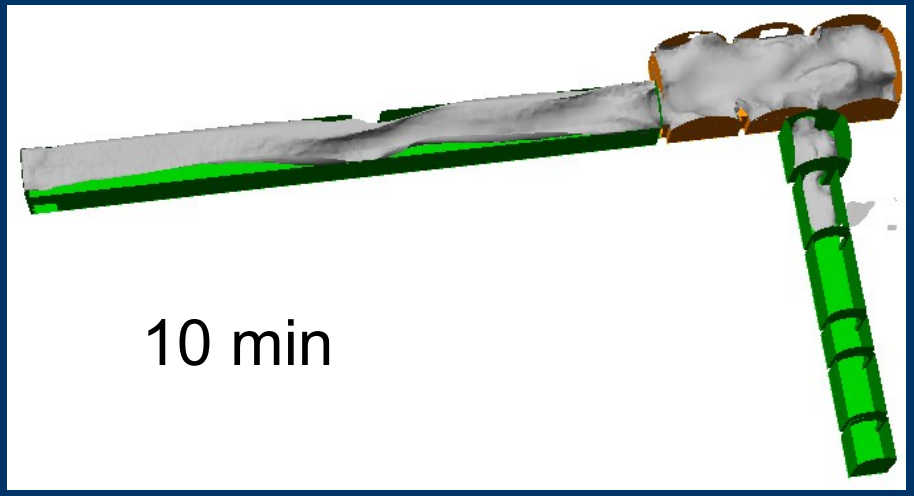
Fire in an office

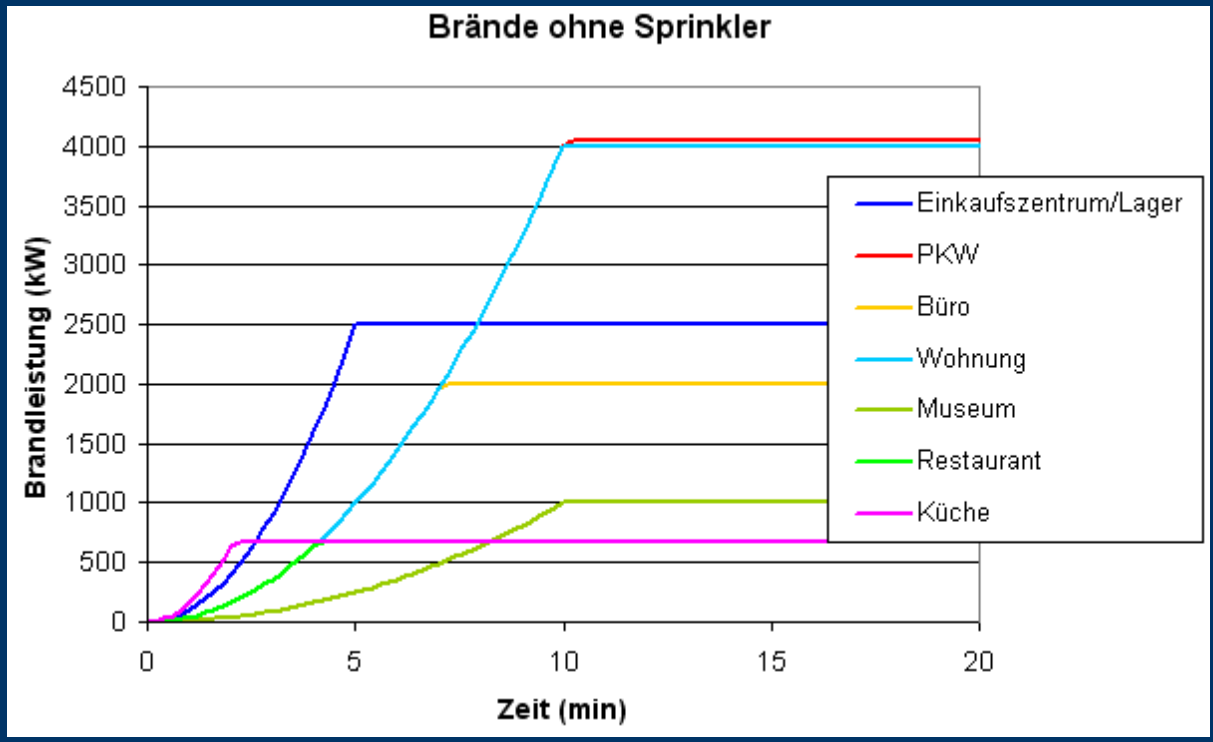






Examples from previous projects

Fires without sprinklers



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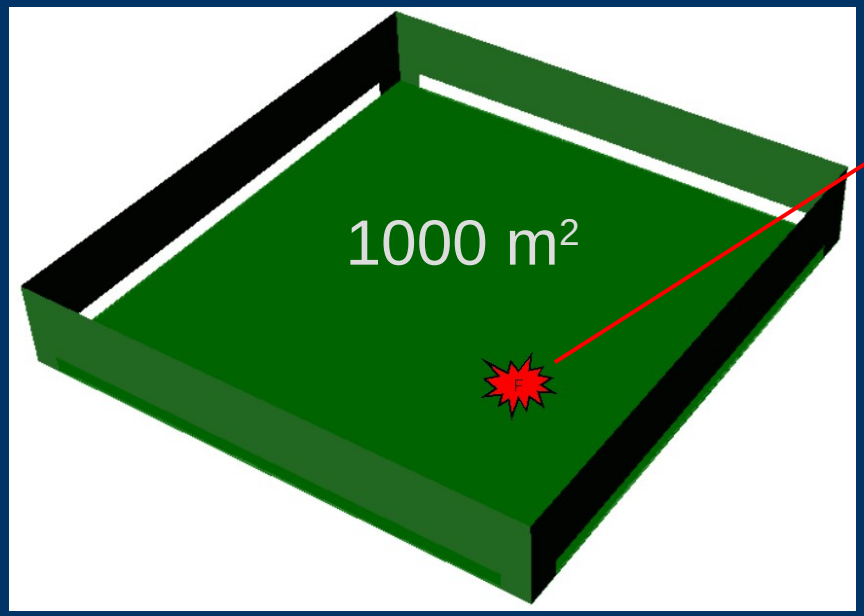
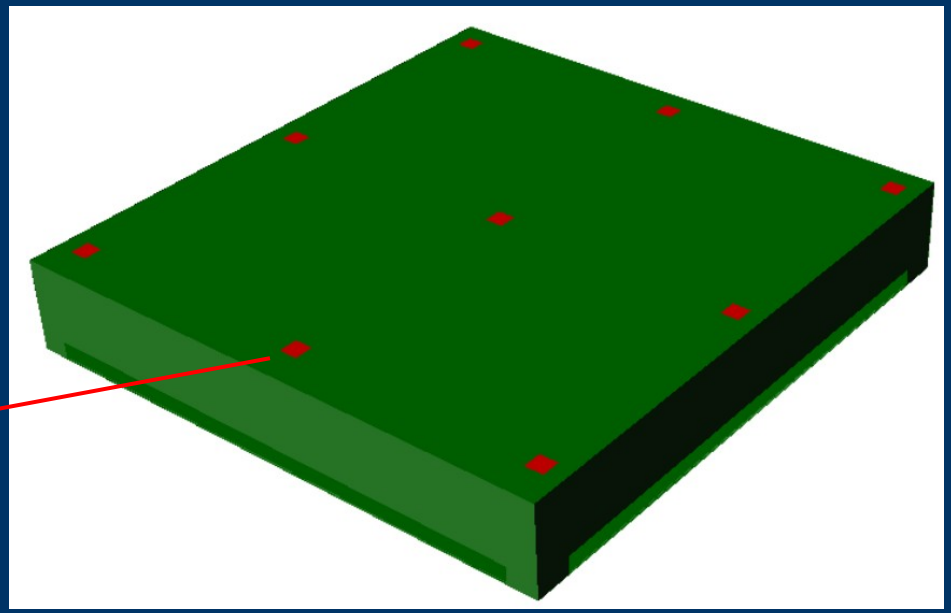
Examples from previous projects

Smoke distribution in a test room



Fire

Mechanical Ventilation



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Examples from previous projects

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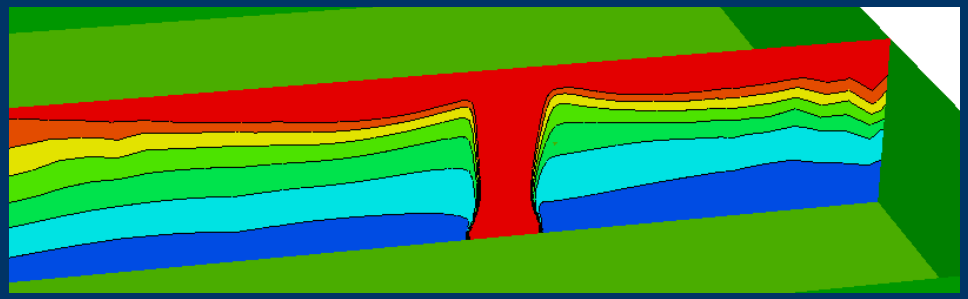
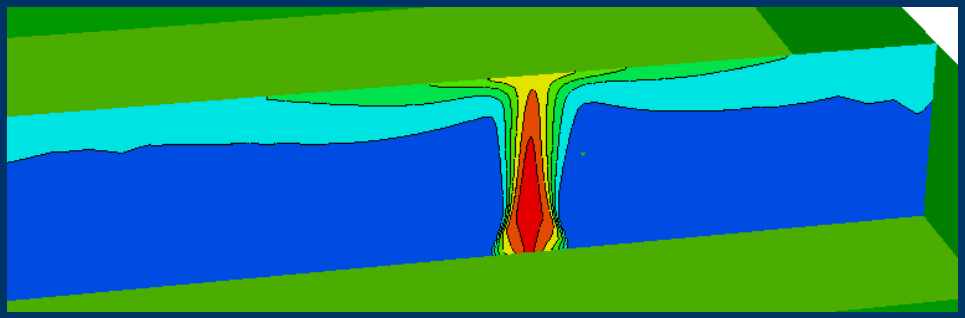
Smoke production

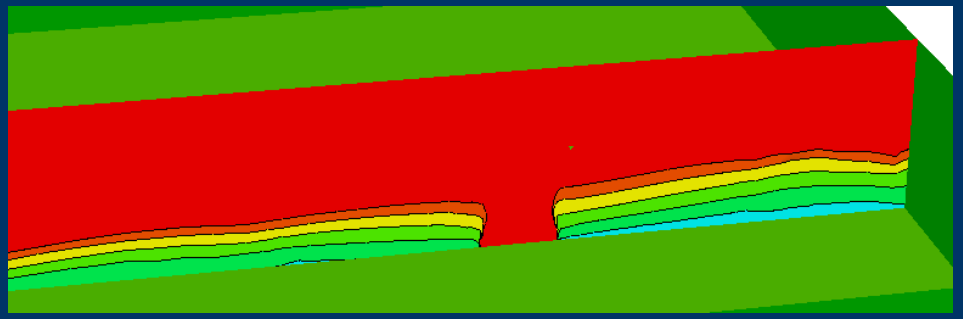
Medium (e.g. soft PU foam; AFC-Standard)



Low (e.g. Wood)



High (e.g. rigid PU foam)



Structure of the Final Report

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2. **Introduction**
3. **Phenomenology of fires in historic buildings**
4. **Model of fires in historic buildings**
5. **Standard Fires**
6. **Reference List**

Conclusions

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Do you see the need for such a project?
Other ideas or suggestions?
Would you like to join us?