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SYSTEMATISATION OF DESIGN FIRE LOADS
in an integrated fire design system

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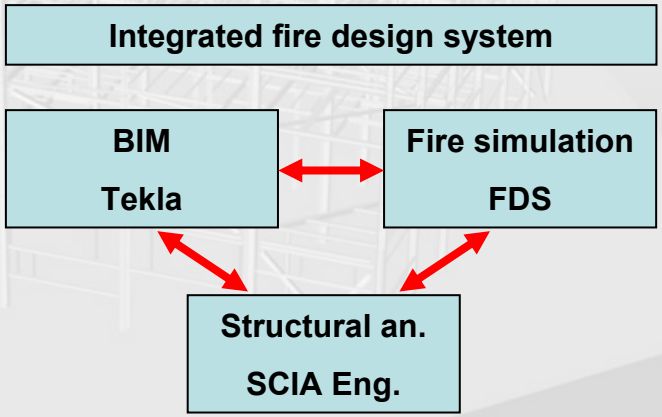
Integrated design system; See: same authors, paper in Prague conference 2009



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Why integrated design system ?

- You can take into account
  - Properties of the real building to be built
  - Model the fire and sprinklers suitable for the building
- => Estimation of the fire safety of buildings is better than using “cooking book” rules
- => Enhance the design process (automatic data transfer between programs)

In this paper:

- ”Standard” fire loads given in BIM
- Sprinklers given in BIM
- => Systematisation given in this paper.
- Authors’ desire: Systematisation = Standardisation in future

- It is believed, that entities of buildings (eg. racks, cars, …) burn same way in every country !

- Fire loads implemented should have strong background (tests, surveys, analysis, sythesis).

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Implemented:

- **Local and global sprinkler fires (see paper).**
- **Eurocode fires based on occupancies of buildings (dwelling, hospital, hotel, …).**
  - **Not for entire floor area, but for chessboard system at random levels (see paper).**
- **Rack fires using 5 categories with burning boxes (defined in paper)**
  - **150 kW/m2 which corresponds to a typical fire load of cellulose materials such as wood and paper.**
  - **300 kW/m2 which corresponds to a typical fire load that may consist of cellulose materials and PET, POM, etc. A furniture fire load may fall in this or the next category.**
  - **500 kW/m2 which corresponds to fire loads consisting of mixtures of cellulose materials (major ingredient) and highly combustible plastics such as ABS, PE, PP and PS, or where plastics such as PET, POM, PMMA.**
  - **1 000 kW/m2 which corresponds to a typical fire load consisting of significant amounts of nonfire retardant, highly combustible plastics such ABS, PE, PP and PS. The other e.g. cardboard boxes, etc.**
  - **2 000 kW/m2 which corresponds to fire load consisting of a very high percentage of non-fire retardant, highly combustible plastics such ABS, PE, PP and PS. E.g. a boat store fire.**
- **Vehicle fires**
  - **Car parks: Proposal for Finland: Type 2 (e.g. Renault Megane) fire. Critical locations following rules of: Shleich J-B, Modern Fire Engineering, Fire Design of Car Parks, Arcelor Profil, Luxembourg, Research Centre, 2010.**
  - **Heavy Goods Vehicle (HGV, 40 MW)**
  - **Petrol Tank (200 MW) based on French rules.**

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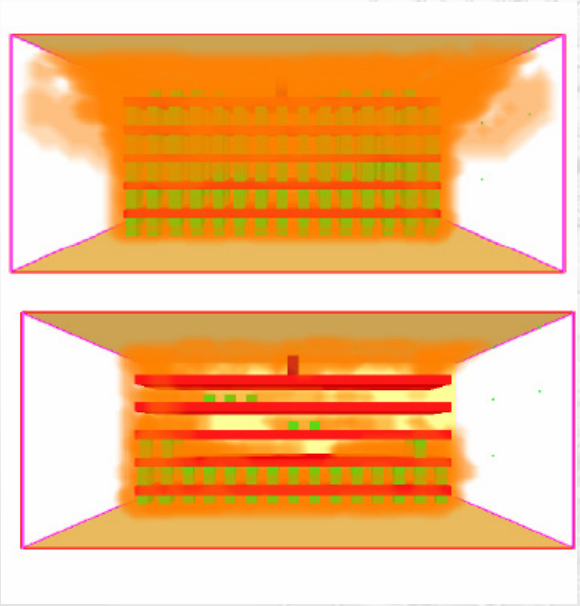
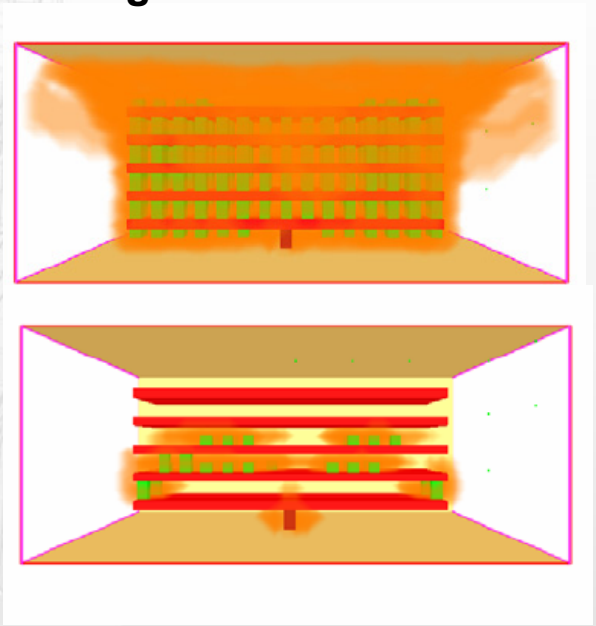
Examples:

Rack fire, category 1000 kW/m2

Ignition up



Ignition down



HGV fire 15 minutes after ignition