

# The Fuego Mechanikaras



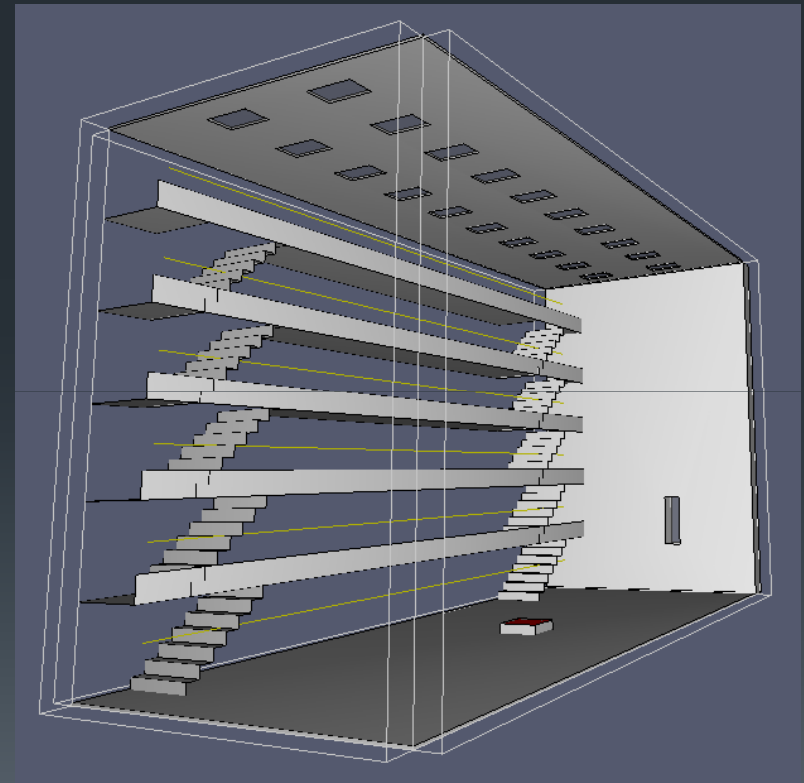
(The greatest fire-engineers)

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# FDS - SMARTMOVE - LS-DYNA

## Fire scenario:

- Fire in the centre of the atrium
- 2 Mw fire
- Medium growth speed
- Natural ventilation on the ceiling (40 m<sup>2</sup>)
- Smoke production 5%



# FDS - SMARTMOVE - LS-DYNA



## Fire scenario:

- One staircase
- Fire in blocking one of the exits
- 200 p/floor
- Departure rate: 60 p/min



7' 20"

5<sup>th</sup>: 3' 46"

4<sup>th</sup>: 4' 08"

## Changes in design:

- Fire alarm pre-record message  
Departure rate: 120 p/min
- Double size of exit door
- Increasing the stair width



5' 50"

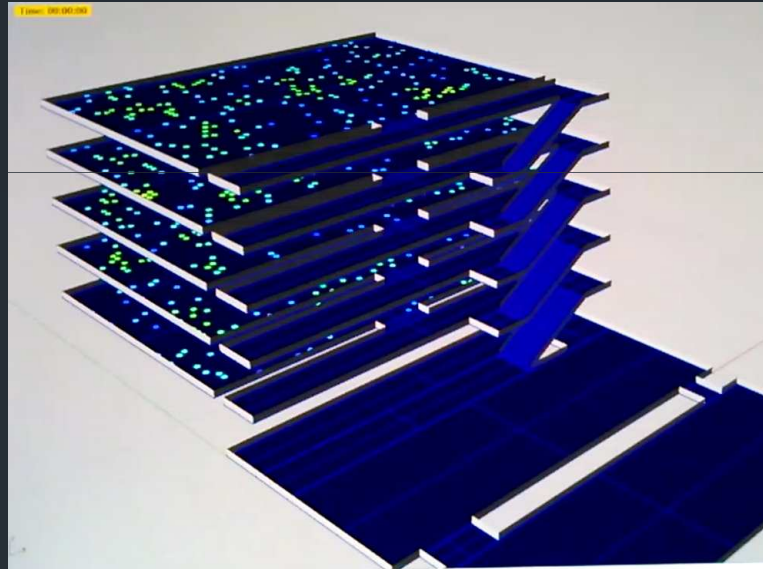
5<sup>th</sup>: 2' 15"

4<sup>th</sup>: 3' 00"

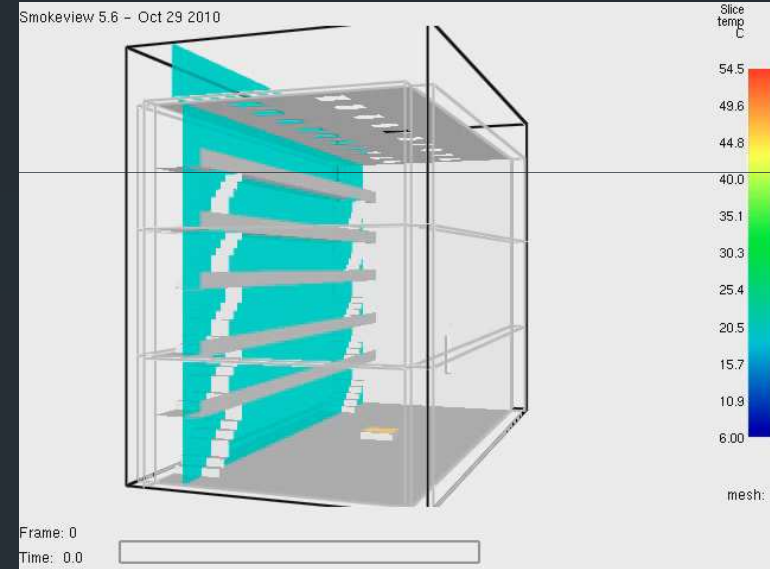
# FDS - SMARTMOVE - LS-DYNA



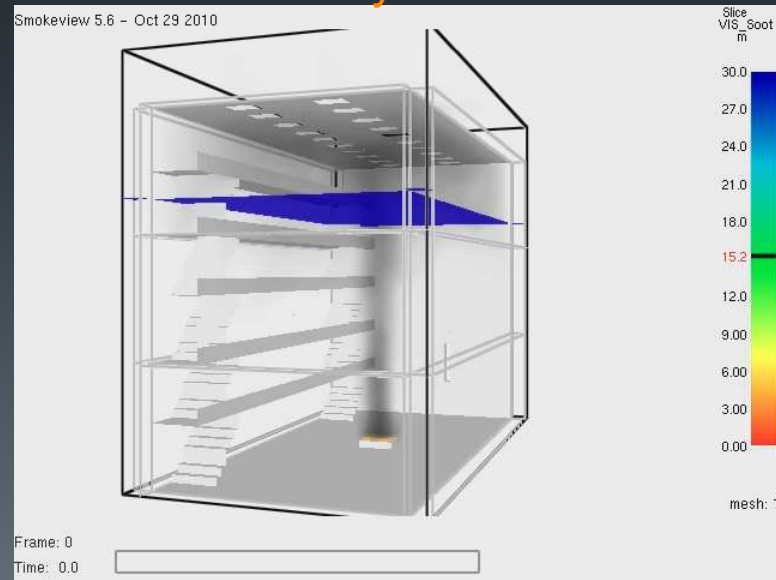
## Evacuation



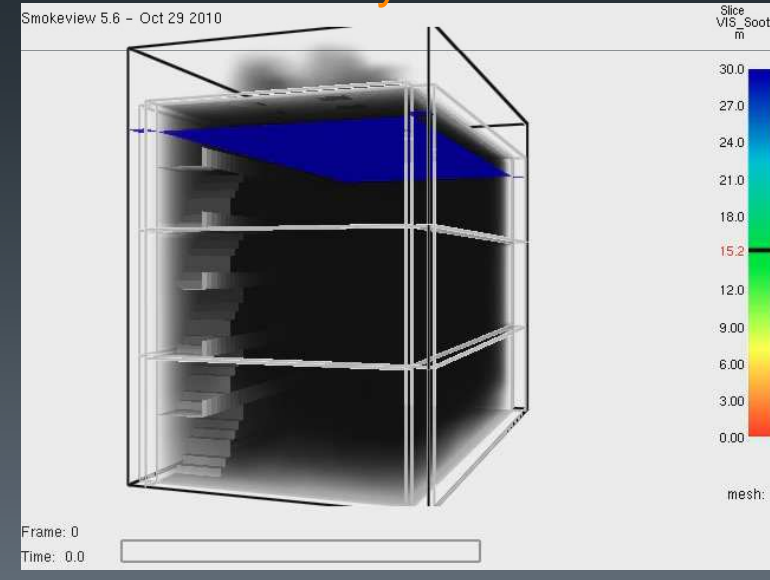
## Balcony Temperatures



## Visibility 4<sup>th</sup> floor

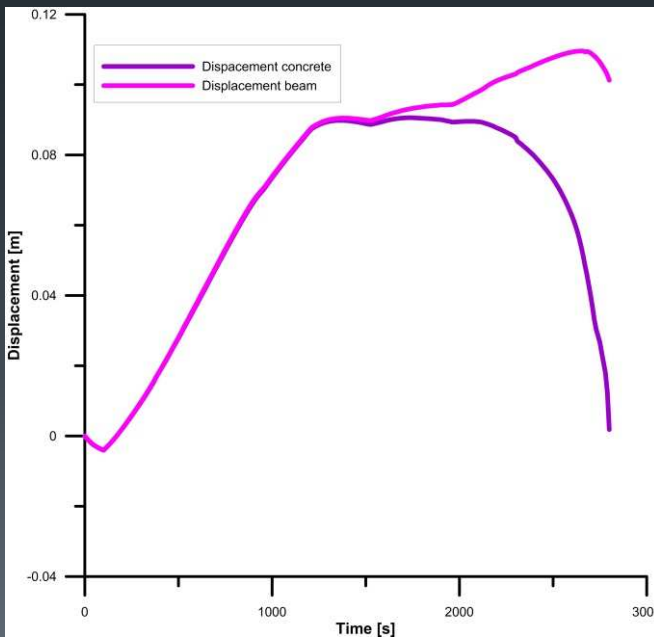
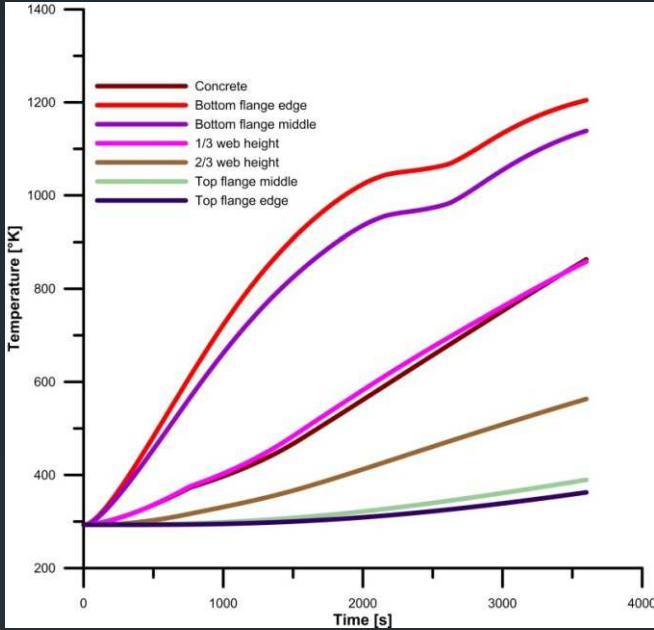


## Visibility 5<sup>th</sup> floor

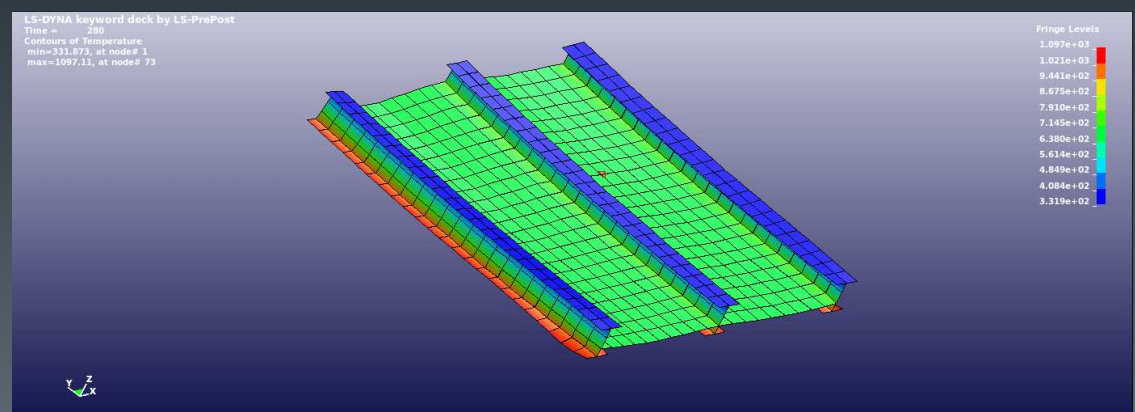
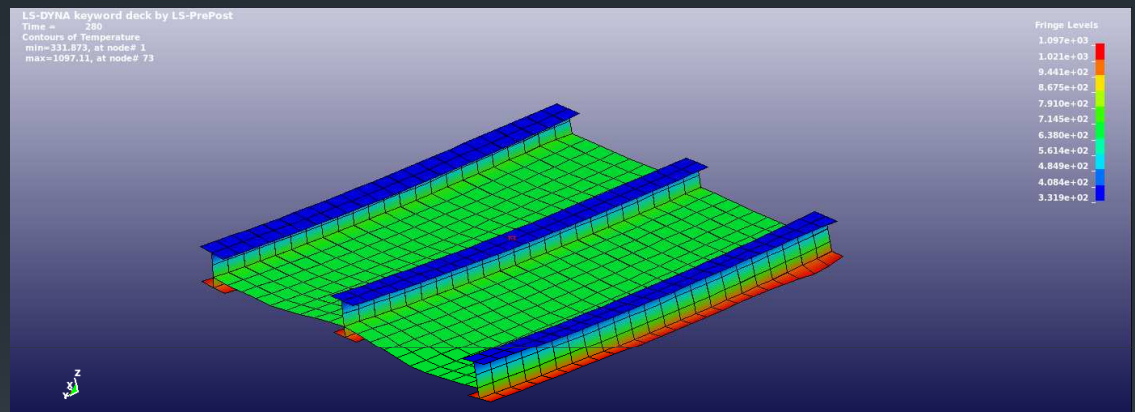
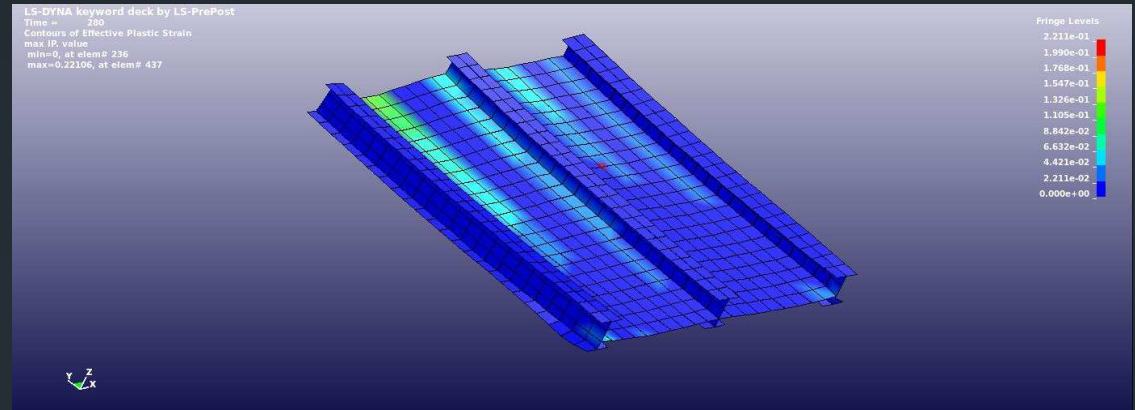




# FDS - SMARTMOVE - LS-DYNA



Effective  
Plastic strain



Temperatures

# Conclusions

**Prerecorded evacuation message**

**+**

**Wider staircase**

**+**

**Wider final exit door**



**The evacuation time < time until minimum visibility limit**



**Safe evacuation  
of 1000 people**

**Structural failure after 45 min**

**Safe for  
fire fighters**

# QUESTIONS



*THANK YOU FOR YOUR ATTENTION*