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**TU/e** EINDHOVEN UNIVERSITY OF TECHNOLOGY

## 12 years Fellowship FSE

- *foundation Fellowship FSE WO2*
- *20 student master research projects*
- *25 student graduation projects*
- *yearly Expertclass*
- *master course FSE TU/e*
- *bachelor course BPS*
- *postgraduate course FSE*

**TU/e** Technische Universiteit Eindhoven University of Technology

**TU/e** Department Built Environment – Unit Building Physics and Services  
Fire Safety Engineering  
10 years Fellowship FSE  
sponsored by the Foundation Fellowship FSE WO2

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1. Introduction and goals
2. Fire Safety Engineering in practice
3. Fire Safety Engineering in research
4. Fire Safety Engineering in education
5. Fire Safety Engineering in society

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## Expertclass *FSE – Next Generation 2025*

- |       |  |
|-------|--|
| 14:00 | WELCOME  |
|       | Introduction – <i>Ruud van Herpen, TU Eindhoven</i>                          |
|       | Fire safety of mass timber buildings – <i>Pascal Steenbakkens, Arup</i>      |
|       | Clay protection of biobased constructions – <i>Johanna Liblik, Tallin UT</i> |
| 15:15 | BREAK  |
| 15:40 | From student to engineer – <i>Robert Groothuis, Nieman</i>                   |
| 16:00 | Pitches: <i>NIPV-VVBA Thesis Contest</i>                                     |
|       | Nominations Thesis Contest – <i>Patrics Robijn, VVBA</i>                     |
| 17:00 | DRINKS   |

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## Expertclass *FSE – NIPV VVBA Thesis Contest*

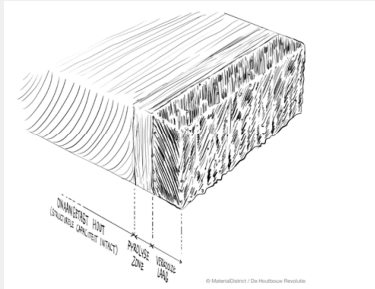
- *Traveling localized fires in large compartments – Laura Dohmen*
- *Fire safety of vertical greenery systems – Carmen Guchelaar*
- *Social distancing voor PV panelen – Amani Maniran*
- *Fire behavior of vertical green systems vegetation – Merel Schouten*
- *Reliability of the traveling car fire concept in open car parks – Samira Safi*
- *Gravity feed sprinkler systems in highrise buildings – Max Verbruggen*

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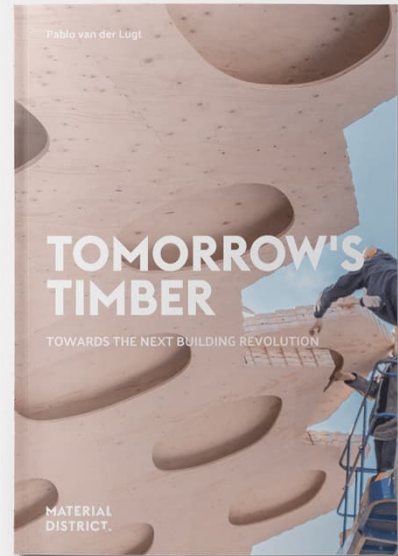
## Tomorrow's Timber

Towards the next building revolution  
(NL: De Houtbouw Revolutie)



When timber burns, it will form a char layer at the surface, behind which the timber will retain significant structural capacity (01).

Does the char layer isolate the timber mass from a compartment fire because of its thermal insulation?



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Pablo van der Lugt – De Houtbouw Revolutie

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## Exposed CLT - Small compartment test



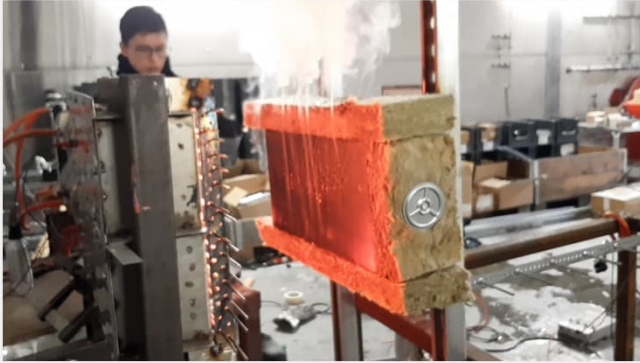
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Sabine Huijmans (Saxion) - Small CLT Compartment Experiment, Peutz Fire Lab 2023

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## Exposed CLT - Radiation flux experiments



Goal:  
Determination of the insulating effect of the char layer

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Andres Berdugo Calderon (PT Torino), Peutz fire lab 2021

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## Exposed CLT - Low radiation flux experiments

CLT: 40-20-40 mm

Sample size: 450 x 300 mm

Glue: PU

Radiation panel: 750 x 630 mm

Radiation flux: 0 – 30 kW/m<sup>2</sup>

gas supply

radiation panel

sample

weighing instr.

Goal:  
Determination of self-extinguishing effect

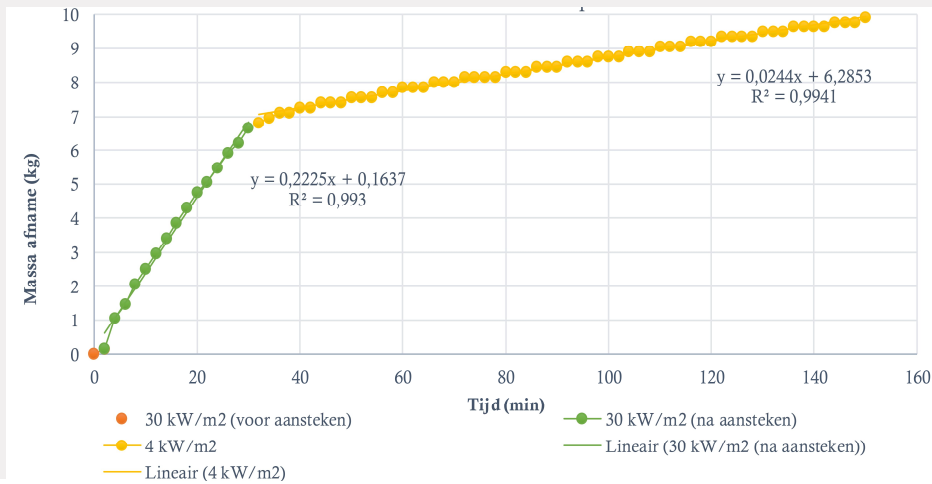
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## Exposed CLT - Low radiation flux experiments

4 kW/m<sup>2</sup> radiation flux on CLT sample, mass reduction per m<sup>2</sup>



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Sella van Poppel (Saxion), Peutz fire lab 2023

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## Exposed CLT

### Conclusions

- Char layer → smouldering combustion  
the combustion layer is not an insulation layer
- The thickness of the char layer does not influence the pyrolysis speed (charring rate is constant)
- The radiation flux determines the pyrolysis speed
- Self extinguishment found at radiation flux < 3 kW/m<sup>2</sup>
- Exposed CLT can be fire resistant but can not be fire resilient

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White paper *Brandveilige toepassing van CLT in woonzorggebouwen* (Woonzorg Nederland, 2024)

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## Residential buildings in CLT

### Recommendation

Isolate CLT constructions from the variable fire load in the compartment or apply a sprinkler protection

- But what protection level do we need Pascal?
- And how can we protect CLT with environmental friendly material Johanna?