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The benefits of research of fires to the fire safety community in Austria

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Local partners – Chances for cooperation

- Platform for cooperation and shaping the future of fire engineering
- Combination of knowledge, knowledge transfer and scientific research
- Prototyping and development
- Combination of fire, structural, mechanical engineering and material science

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Local partners – **Safety Engineering GMBH**

SAFETY ENGINEERING GMBH
SAFETY FOR YOUR LIFE

https://www.brandschutz-kaernten.at/

Engineering office

- Fire protection concepts
  - Fire alarm systems
  - Sprinkler systems
  - Extinguishing systems
  - Alarm systems
  - Fume extraction systems
  - Pressure ventilation systems
  - Provisioning systems for extinguishing water
- Rehabilitation concepts
- Technical fire control construction support

Officicial experts in fire engineering

→ Profit of valuable insights of engineers in the field

→ Close connection to the industrial producers

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Local partners -

Kärntner Landesfeuerwehrverband

- **<u>Training school for future and established firefighters</u>**
  - Ranging from basic training and leadership development to technical trainings of machines and safety equipment

  →Possibilities for producers of safety and firefighter equipment for a short-term feedback directly from the relevant target group

  →cooperation allows for integration of this partner in funded research applications and research and development (R&D)

https://www.feuerwehr-ktn.at/landesfeuerwehrschule

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Local partners –

Kärntner Landesfeuerwehrverband

- Simulation of House fires
- Test of fire existing fire extinguish equipment and systems
- Test of personal safety equipment

→ Possibility for knowledge transfer directly where it is needed.

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The living lab – technical possibilities at **CUAS**

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Laboratory for structural engineering

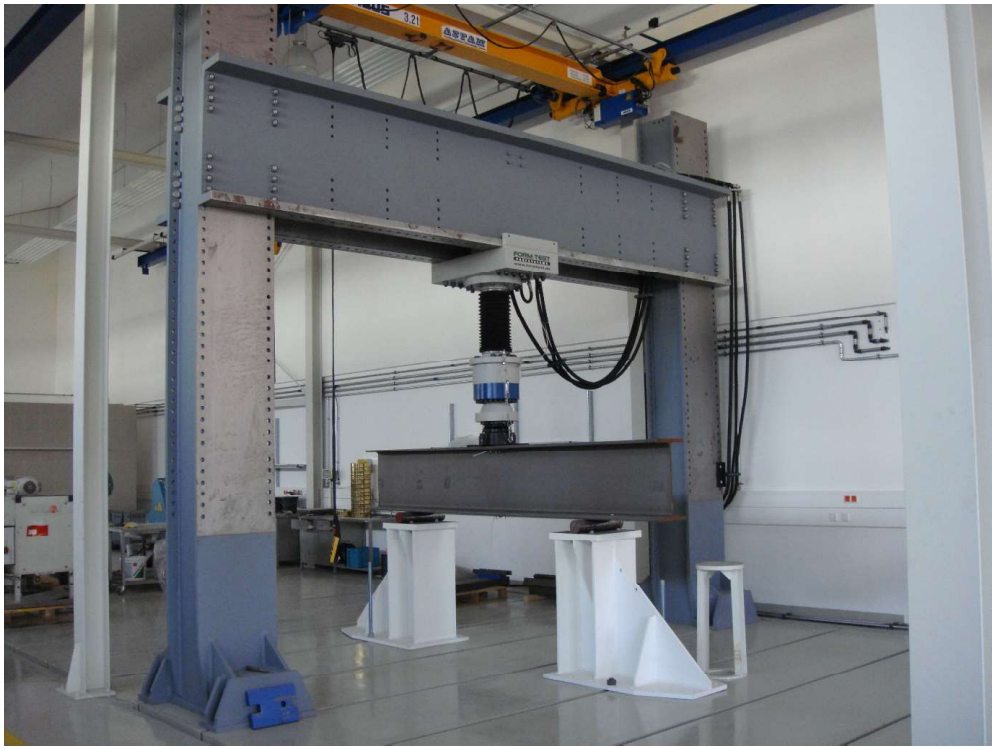
SYSTEMCERT ISO 9001 zertifiziert Reg.Nr. Q0860609

BAULABOR FH KÄRNTEN

- Established and certificated quality management system

The main fields of research:

- Building material technology and fire engineering
- Analysis of load-bearing behavior
- Fastening technology and structural strengthening
- Building physics studies



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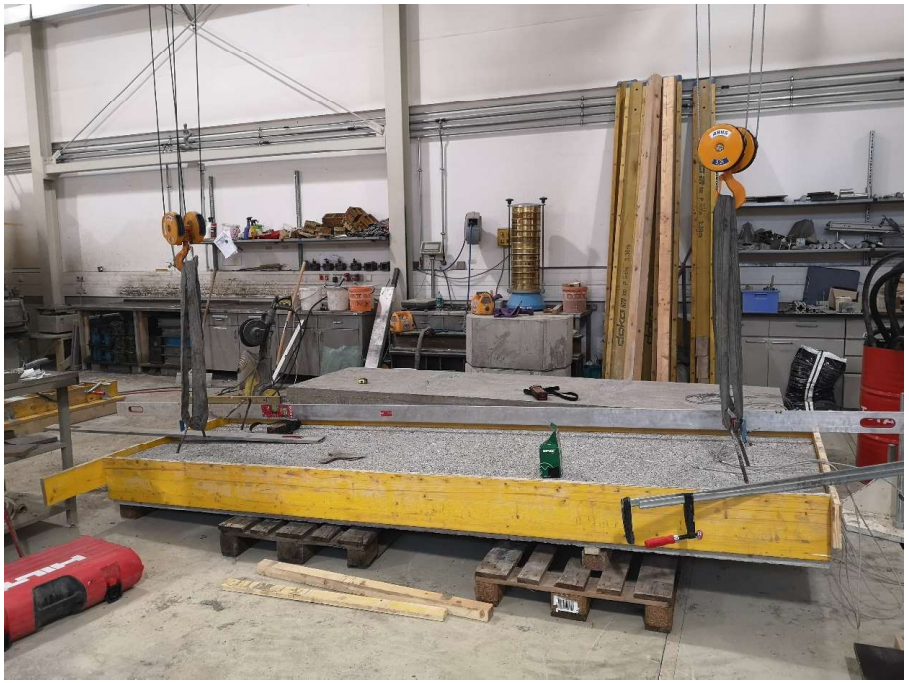
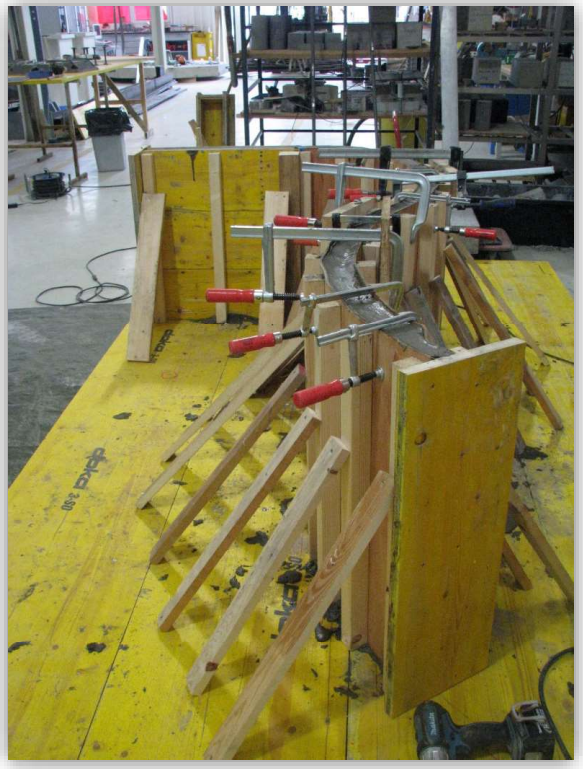
In house joinery and concrete casting





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Laboratory for material development

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Heat treatment oven for small size material testing

- Electrical heated oven
- Up to 1300 degrees

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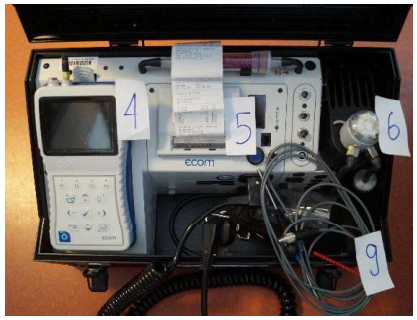
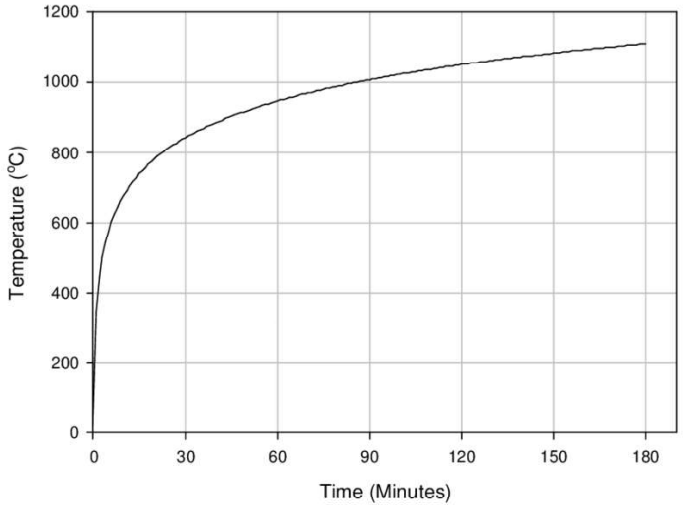
Experimental oven for concrete slabs and dowel testing



- Oil burner with 386 kW
- ETK curve



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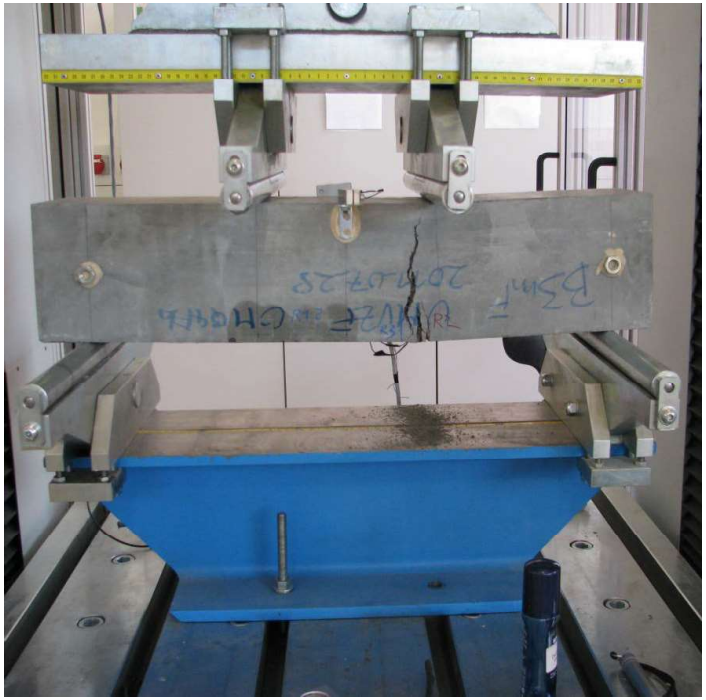
Material testing

- High performance materials
- Concrete, Steel, FRPs, Wood



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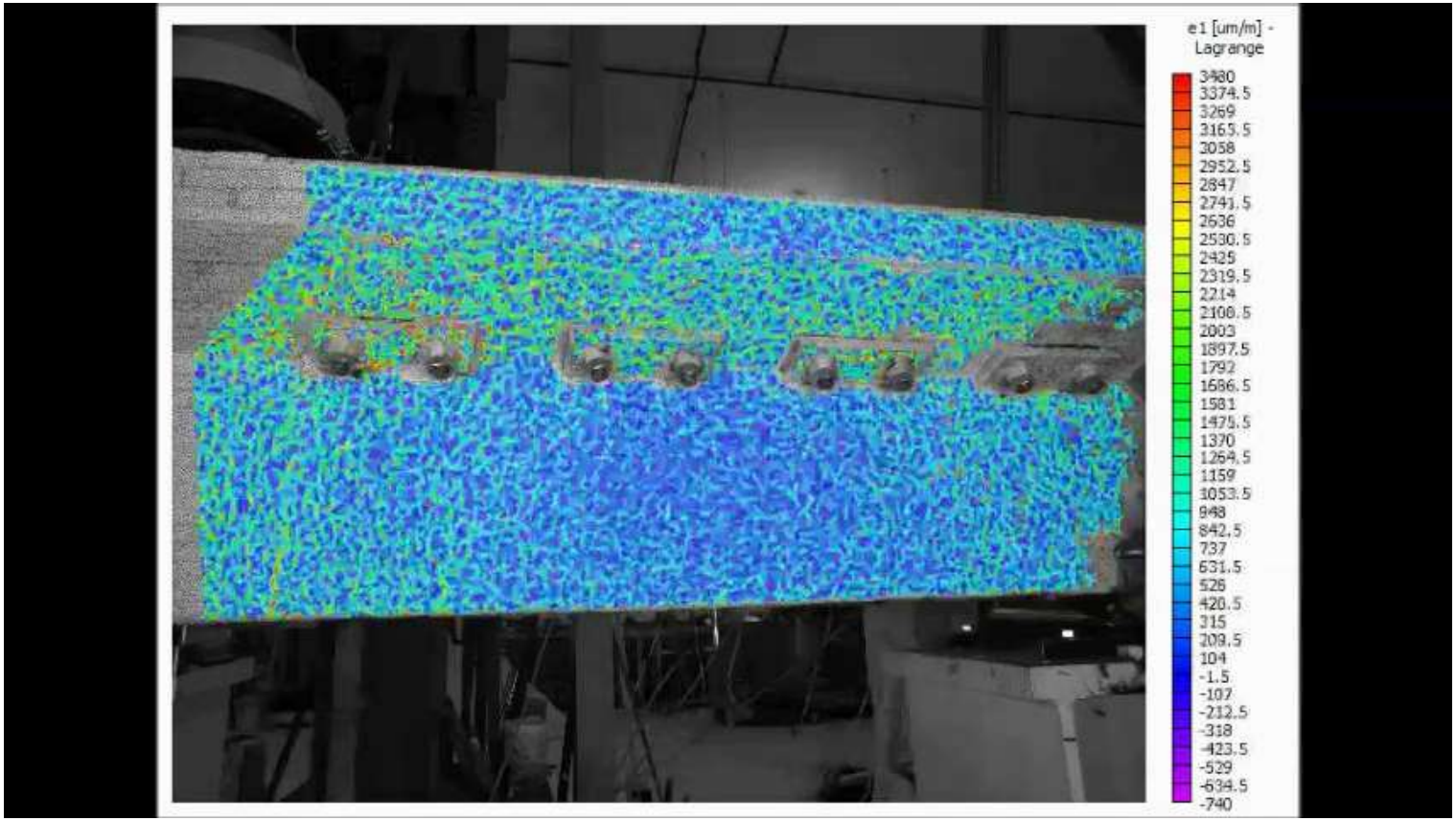
Static tests

- **10 kN to 2100 kN**
- **3 or 4-point bending**
- **Monitoring with conventional and digital image correlation software**



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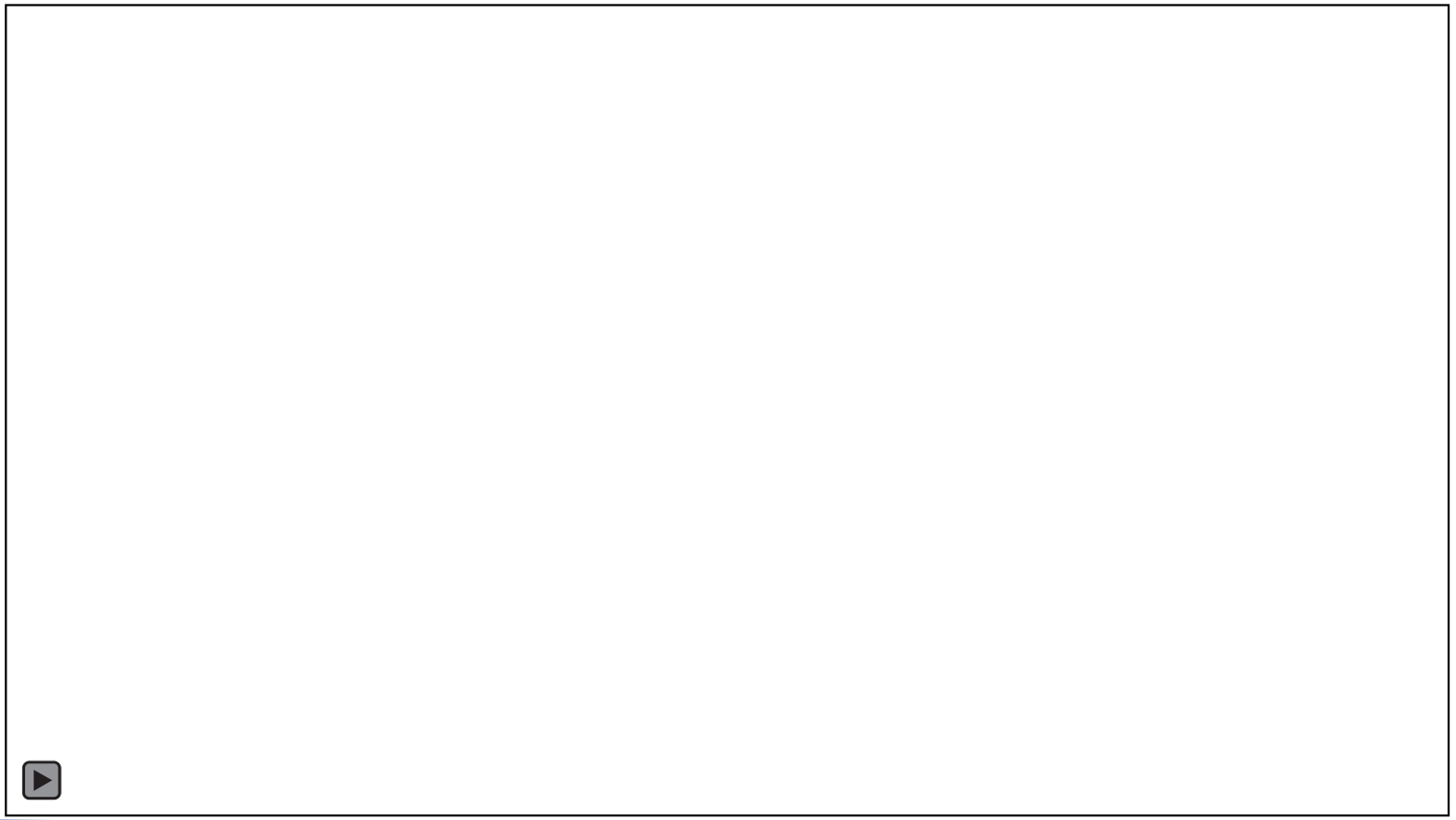
Fatigue testing

- **- 500 kN to + 500 kN**
- **Up to ~7 Hz testing**
- **Monitoring with conventional and digital image correlation software**



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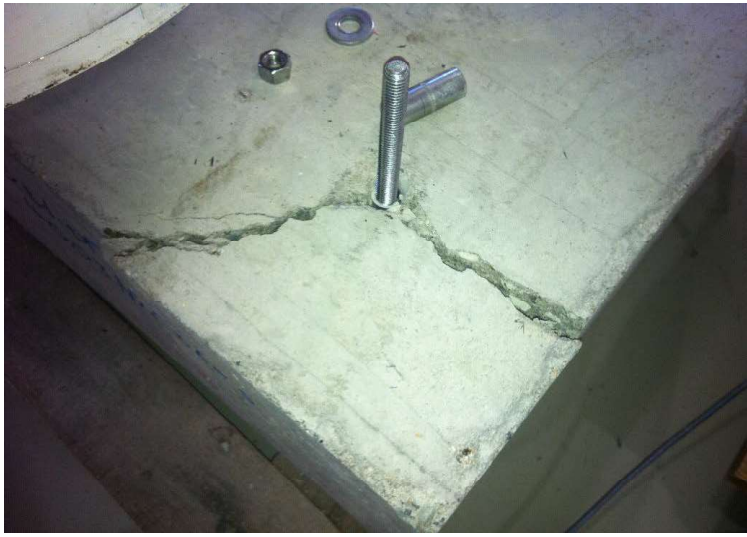
Fastening technology and structural strengthening



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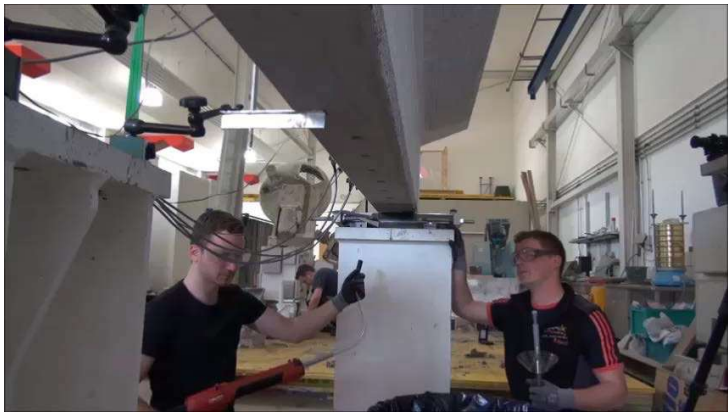
Structural strengthening

Fiber reinforced Polymers

Textile concrete



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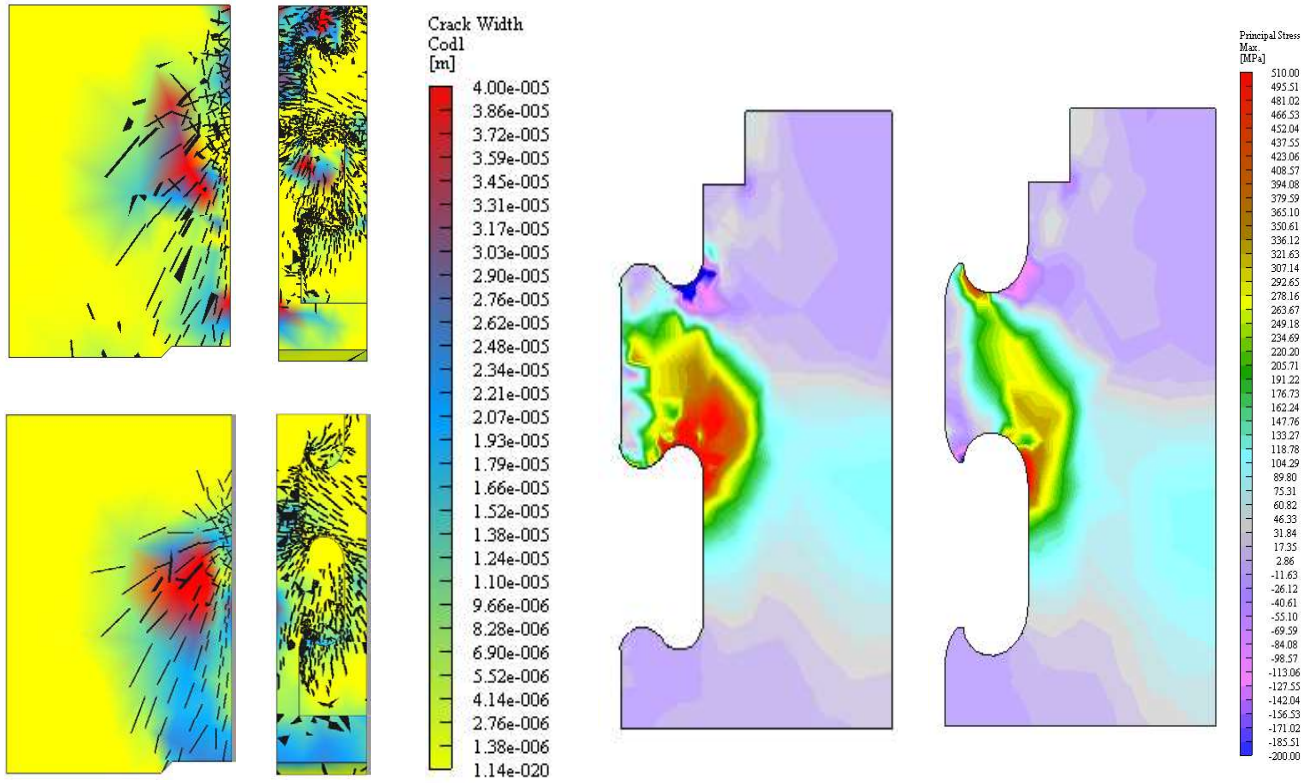
Finite element modelling and fire simulation



- ATENA from Cervenka consulting for FEM modeling
- Internal stresses, crack prediction, failure mode prediction

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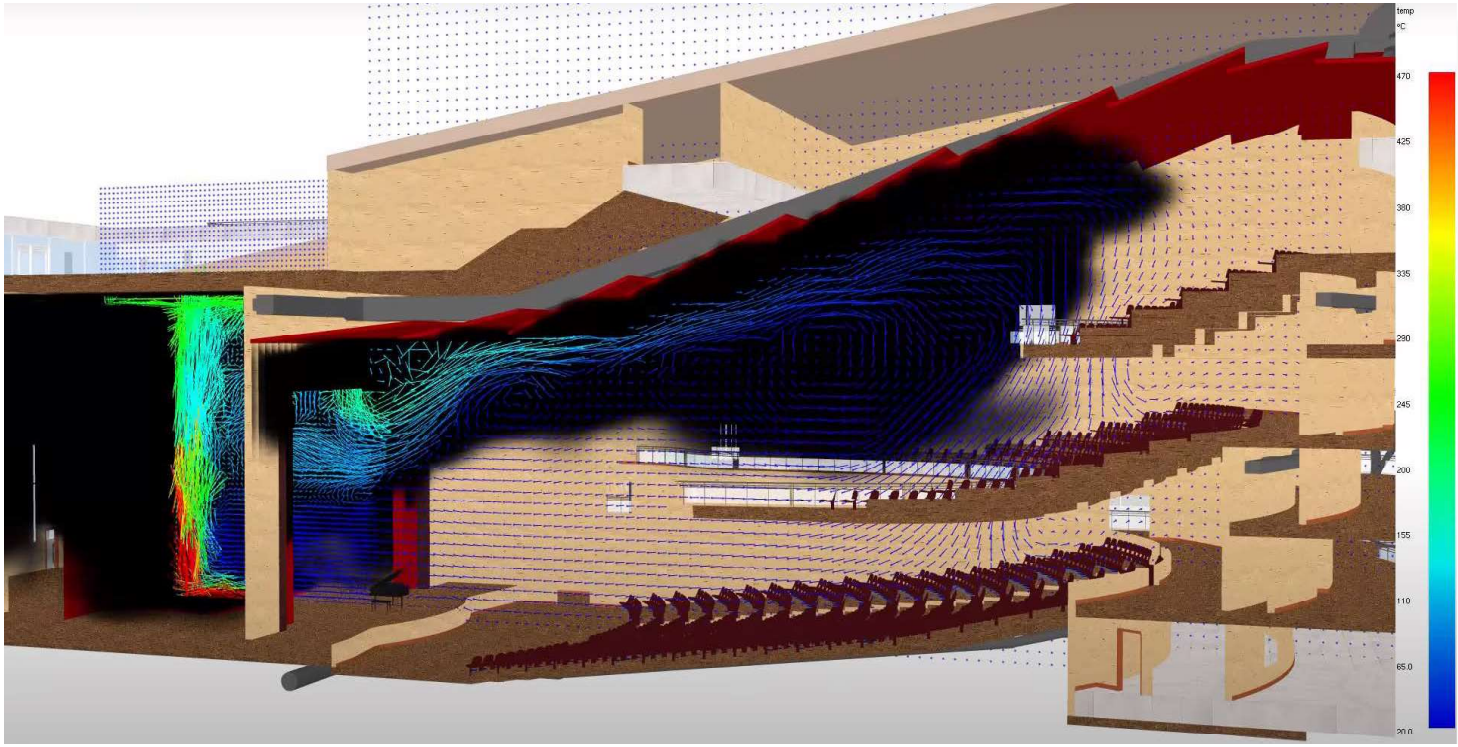
PyroSim – Thunderhead engineering

CAD import and convert to FDS (Fire Dynamic Simulation) models
Placement of the



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Building physics studies

- North fassade with different facade and wall constructions for real weather and UV-light conditions testing

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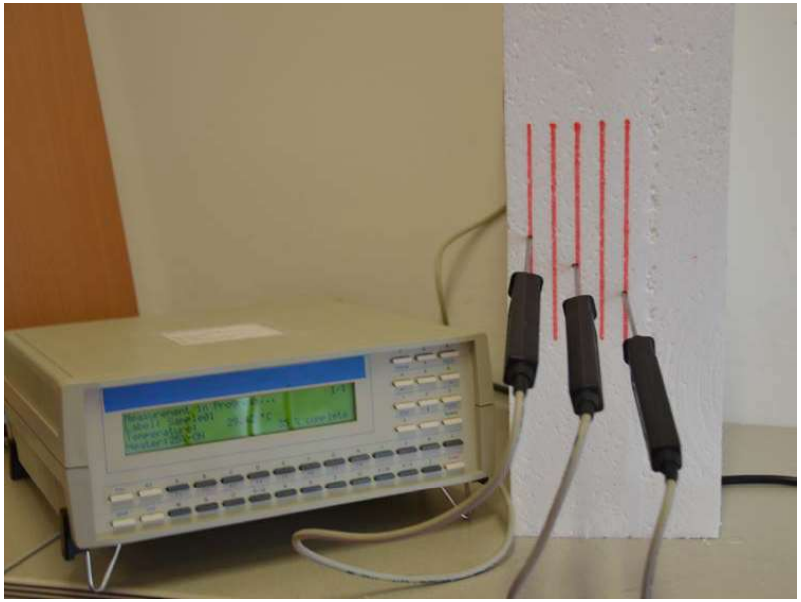
Building physics studies

- Climate chamber for wall constructions

- Material testing for thermal conductivity



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Smart lab Carinthia – Prototyping Lab

Equipment

Additive manufacturing

- FDM printer (1 und 2 nozzles)
- FDM bondprinter
- SLA stereolithographie
- SLS Laser sintering machine

Subtractive manufacturing

- Desktop milling machine 3-axle
- Prototyping milling machine 4-axle
- Vinyl Cutter
- Lasercutter
- Circut board milling machine

Accessories for 3D printing

- Curing chamber
- Washing chamber
- Sandblasting box

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Small milling machine

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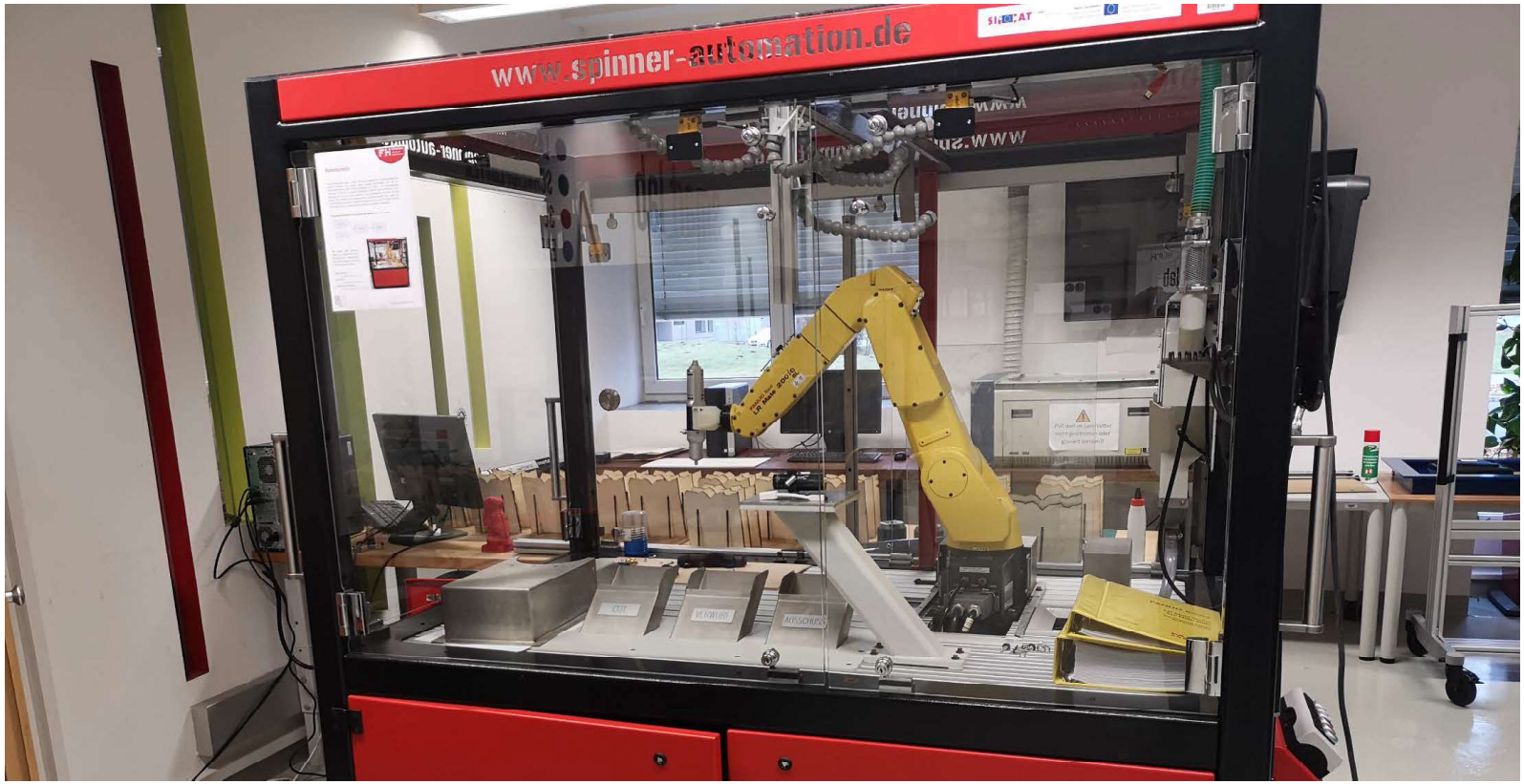
Automation processes



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Automated Milling machine and turning lathe

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Additional milling machine and turning lathe, etc.

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Examples for developed protypes

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