HIGH-PERFORMANCE INSULATION MATERIALS

- Realistic design values for use in energy-efficient buildings

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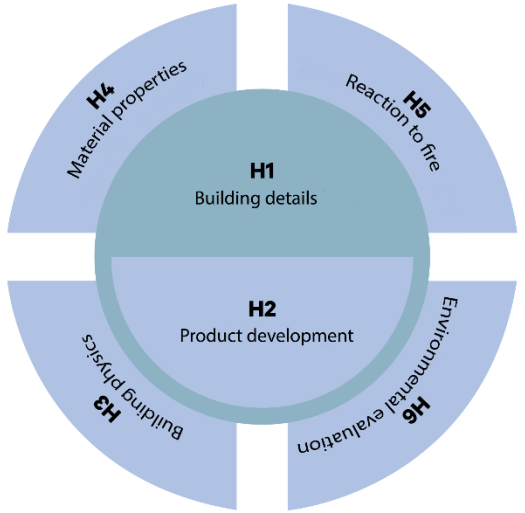
A part of the SuperIsol research project
(Norweigan Research Council, ENERGIX)

The SuperIsol research project

New system solutions for superinsulation in Norwegian buildings



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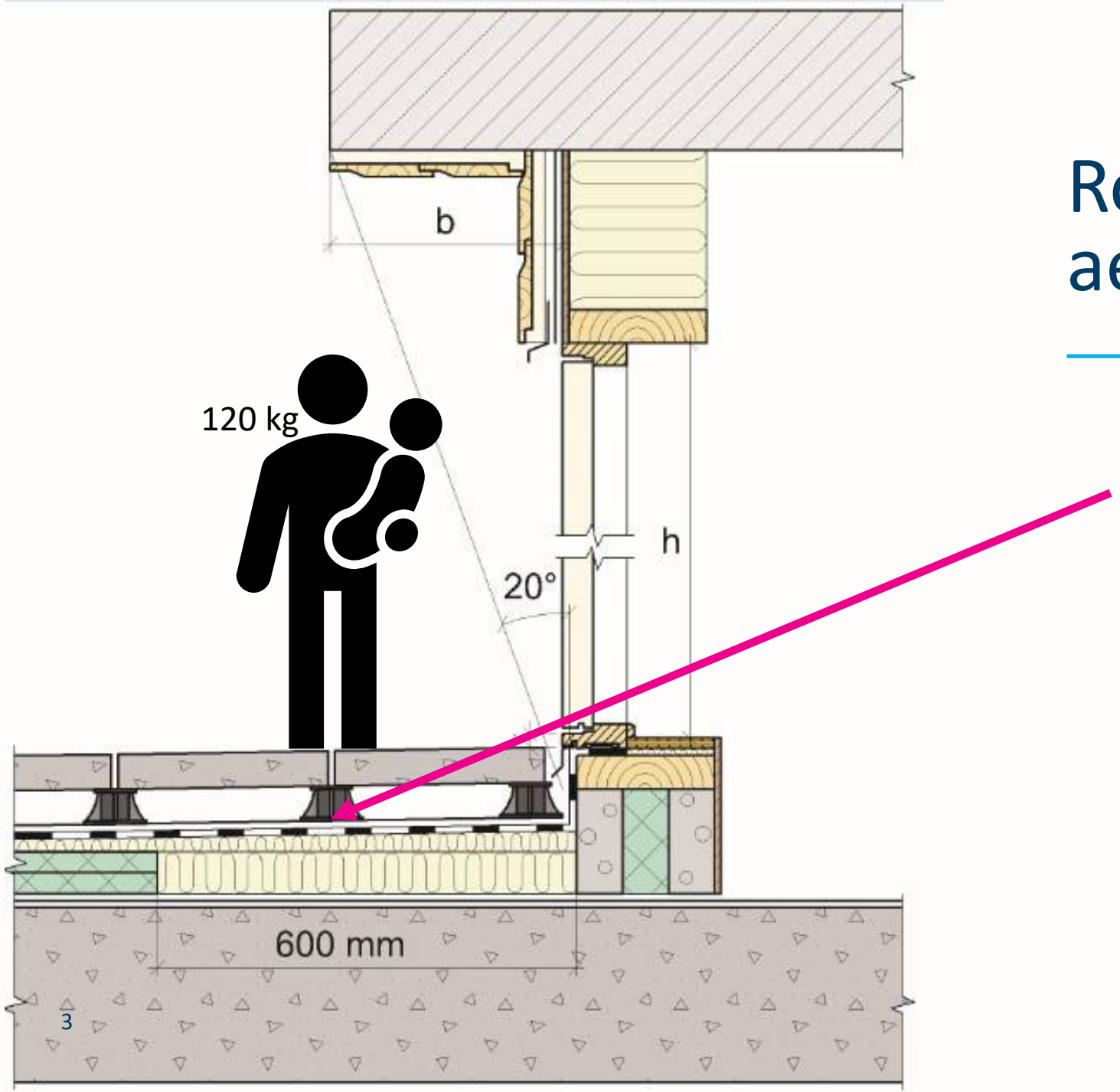
Roof-top terrace with aerogel insulation



45 kPa

Can the aerogel withstand this load?

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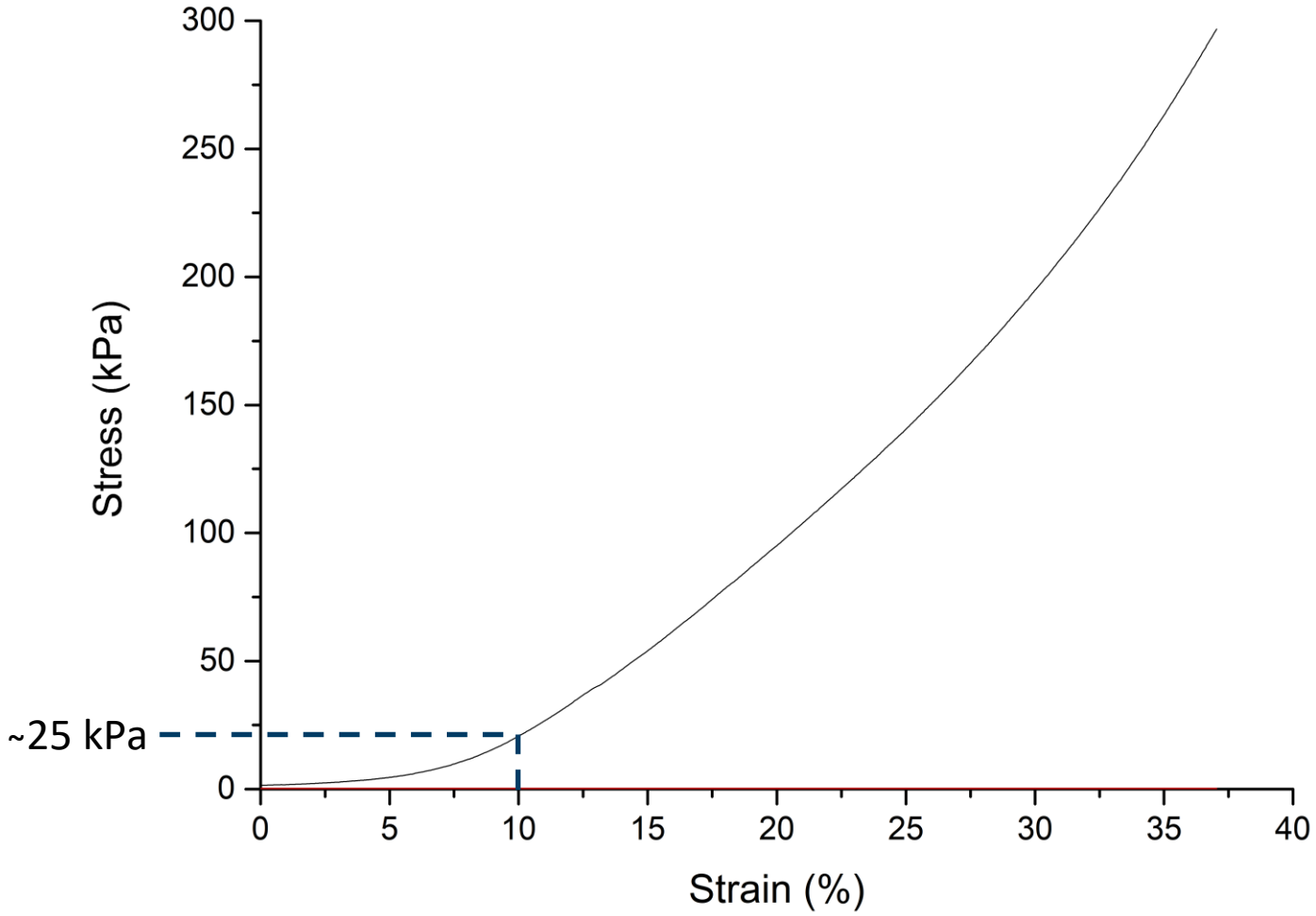
Compressive stress at 10 % deformation



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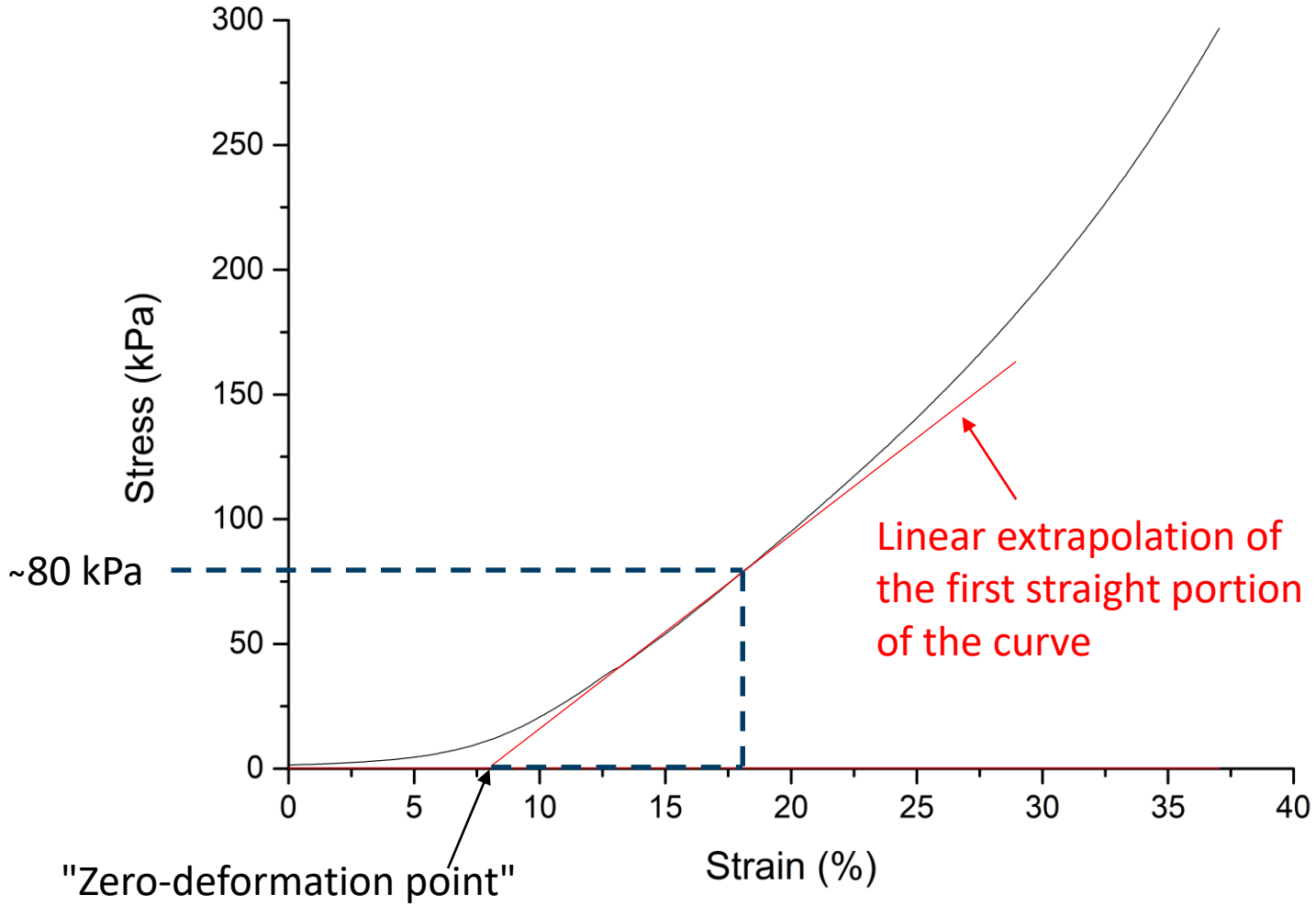
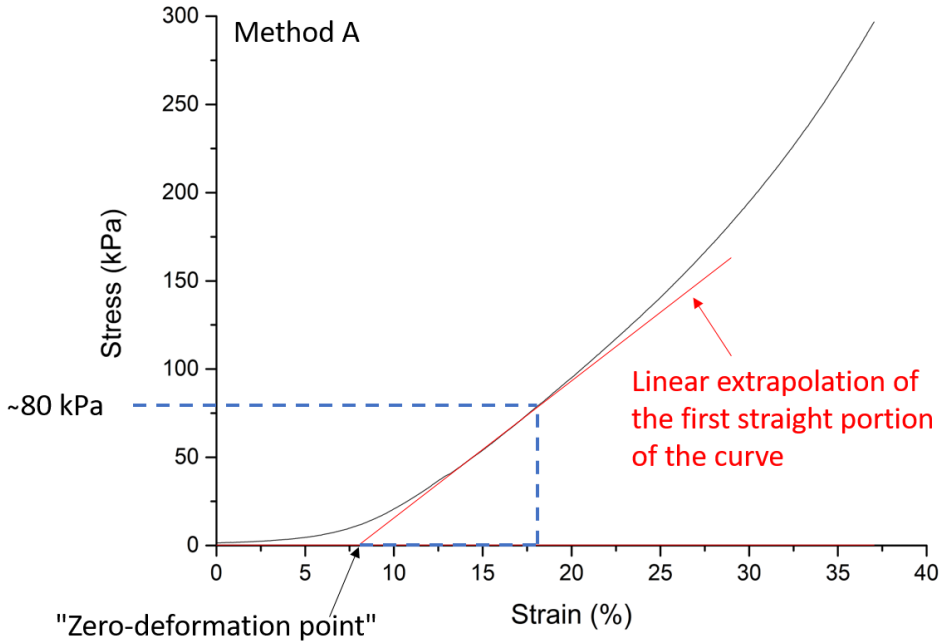
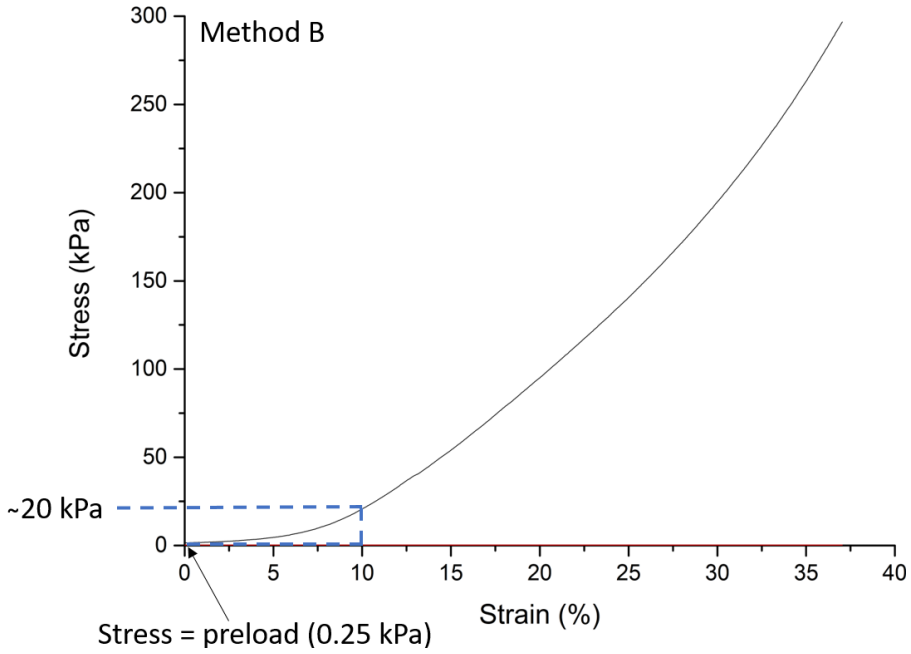
Compressive stress at 10 % deformation



Declared value is subject to interpretation





Knowledge of the material, and its compression behaviour beyond just the declared value is important in a design process.

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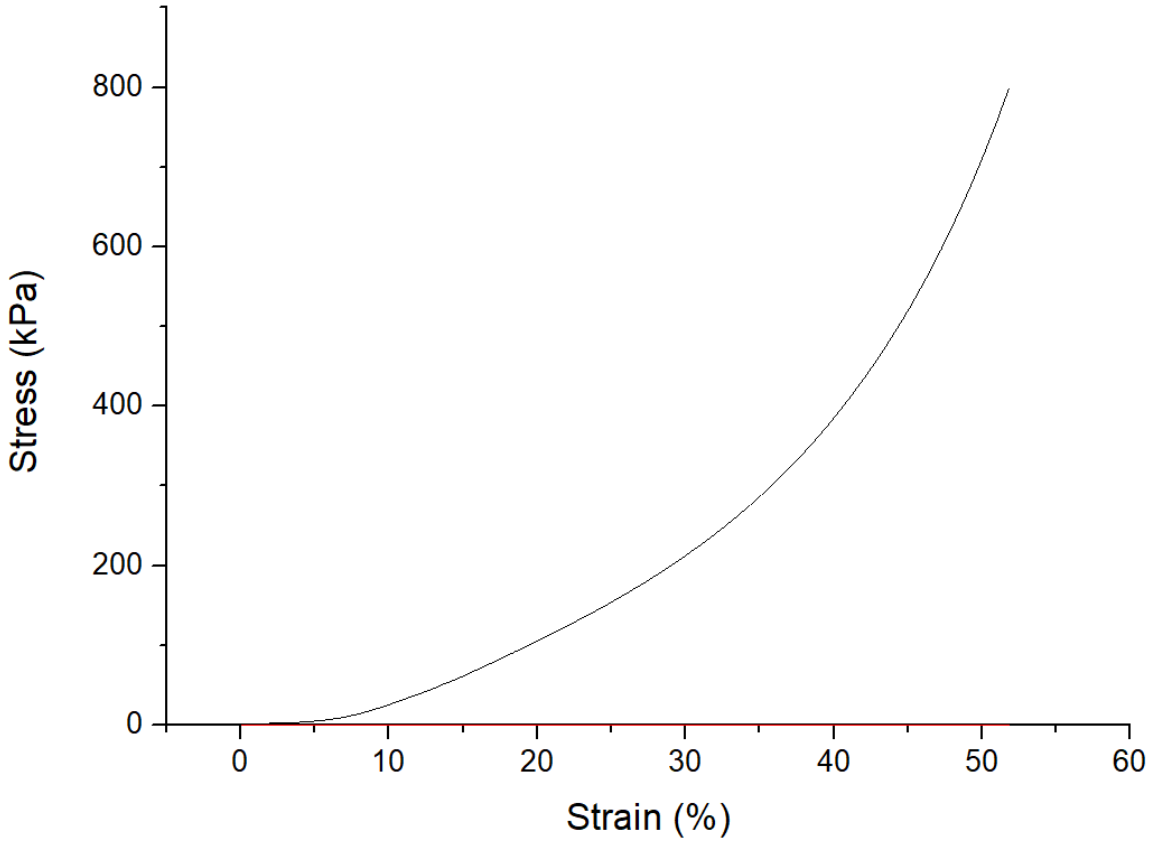
Knowledge from the stress-strain curve



- Aerogel insulation blankets will not fracture under normally occurring loads
- There will be some deformation
- How will it affect thermal conductivity?

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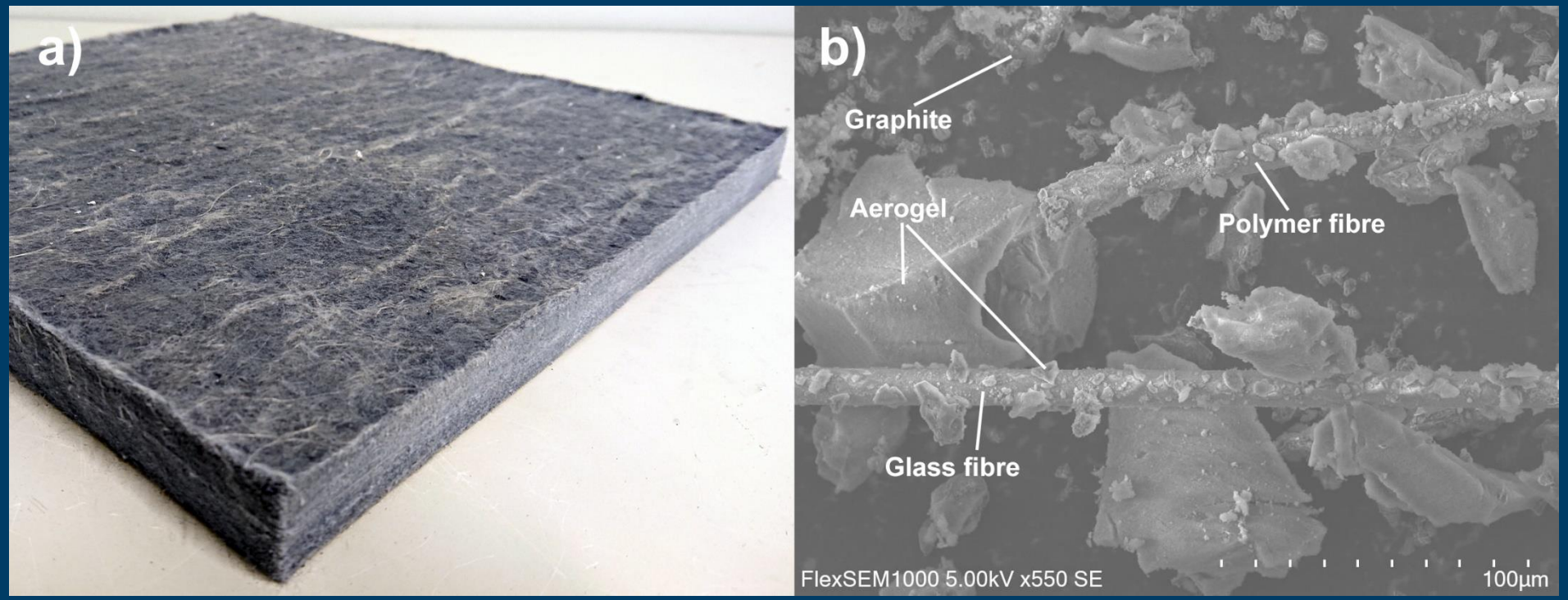
Aerogel insulation blankets



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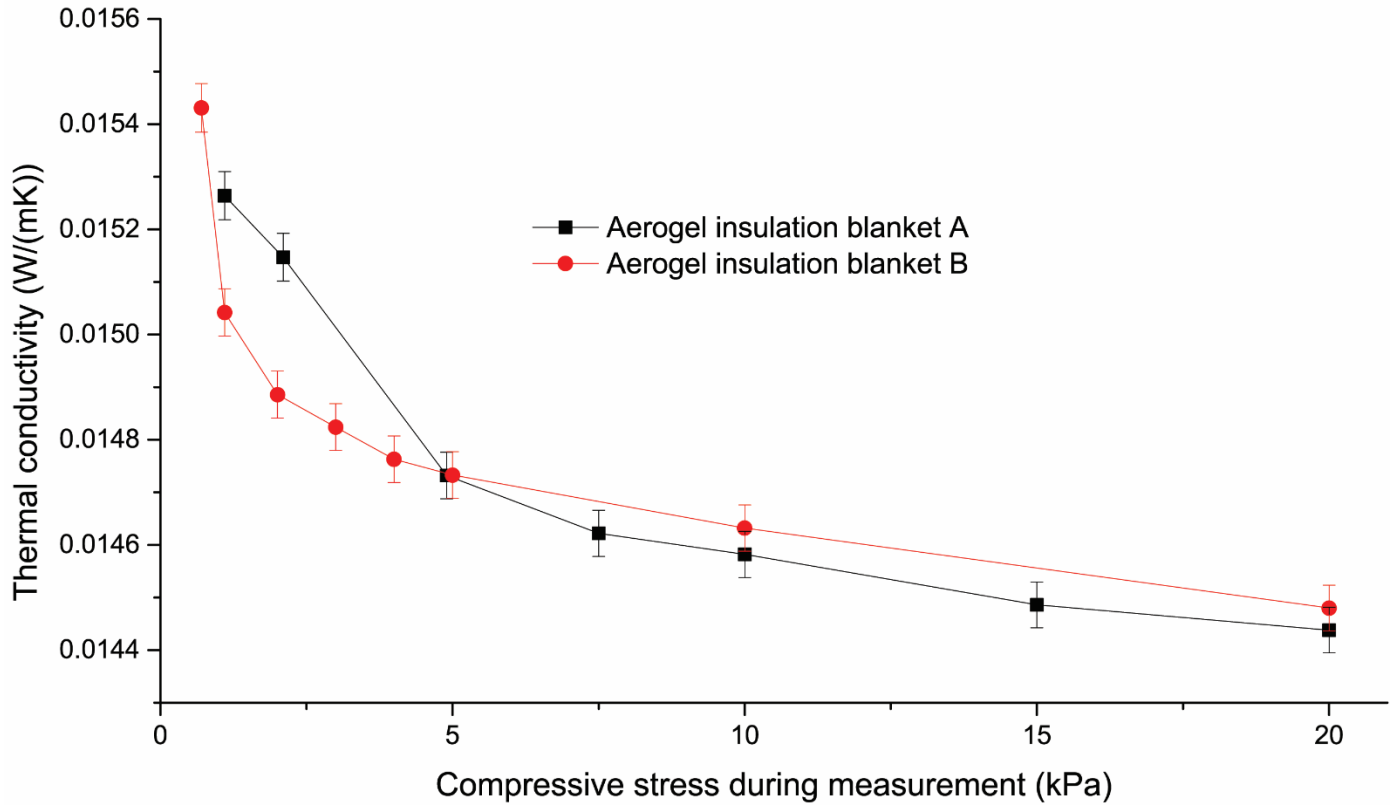
Thermal conductivity (λ) as a function of compressive stress for aerogel insulation



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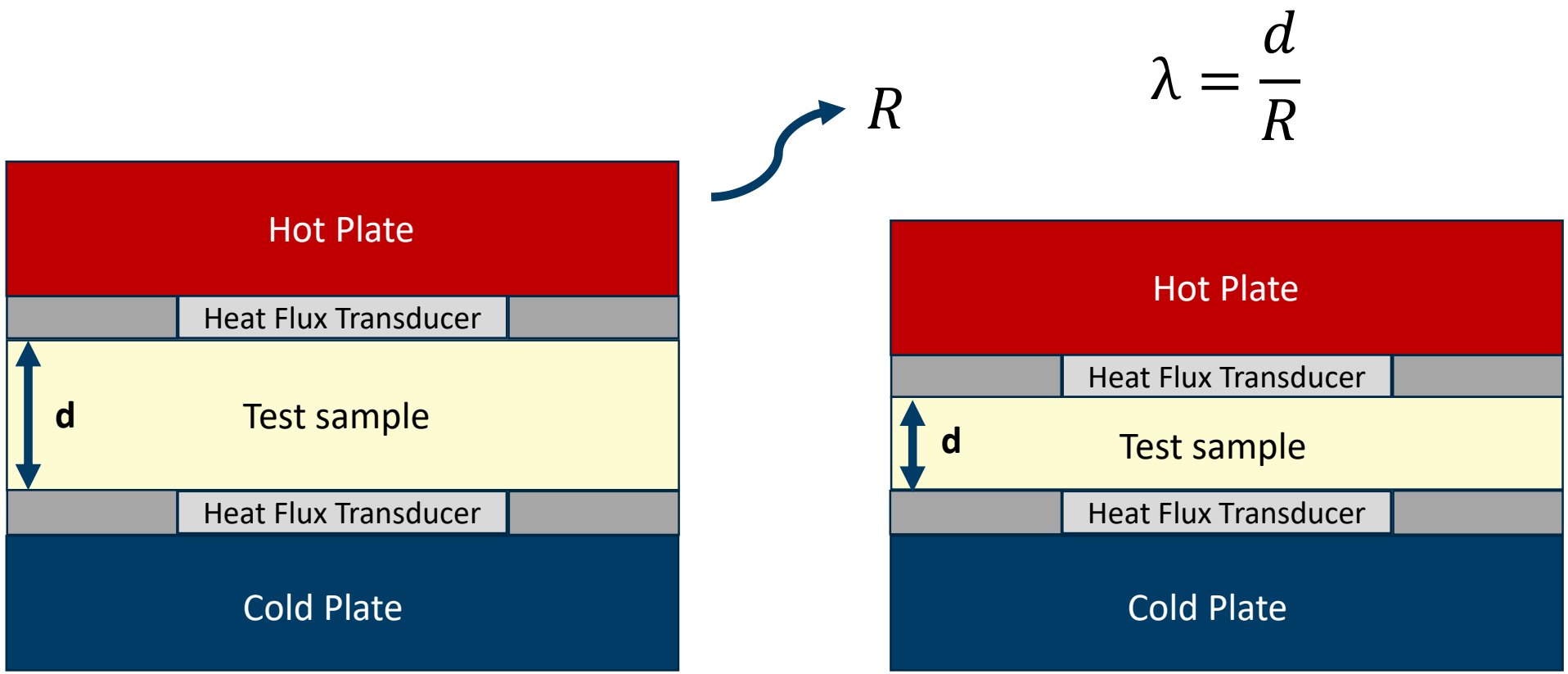
Heat flow meter measurement



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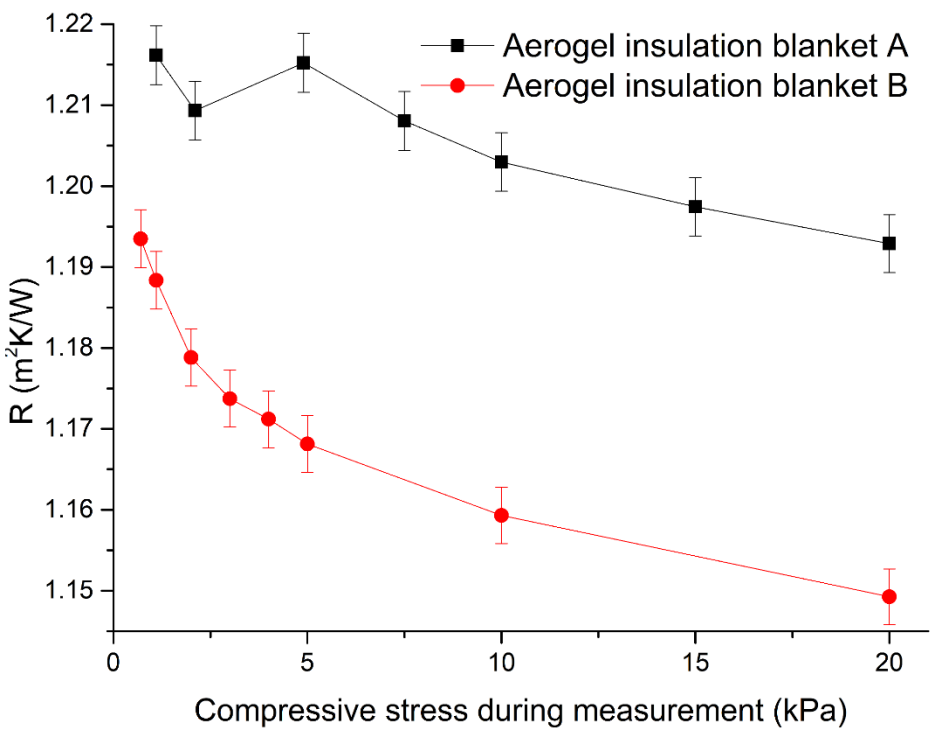

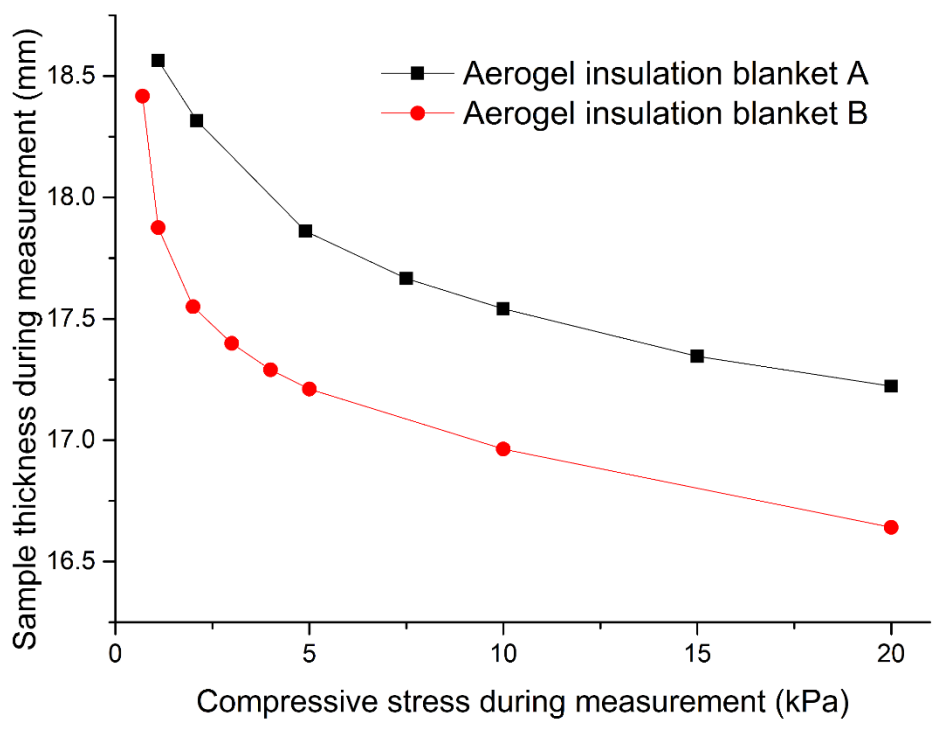

$$\lambda = \frac{d}{R}$$

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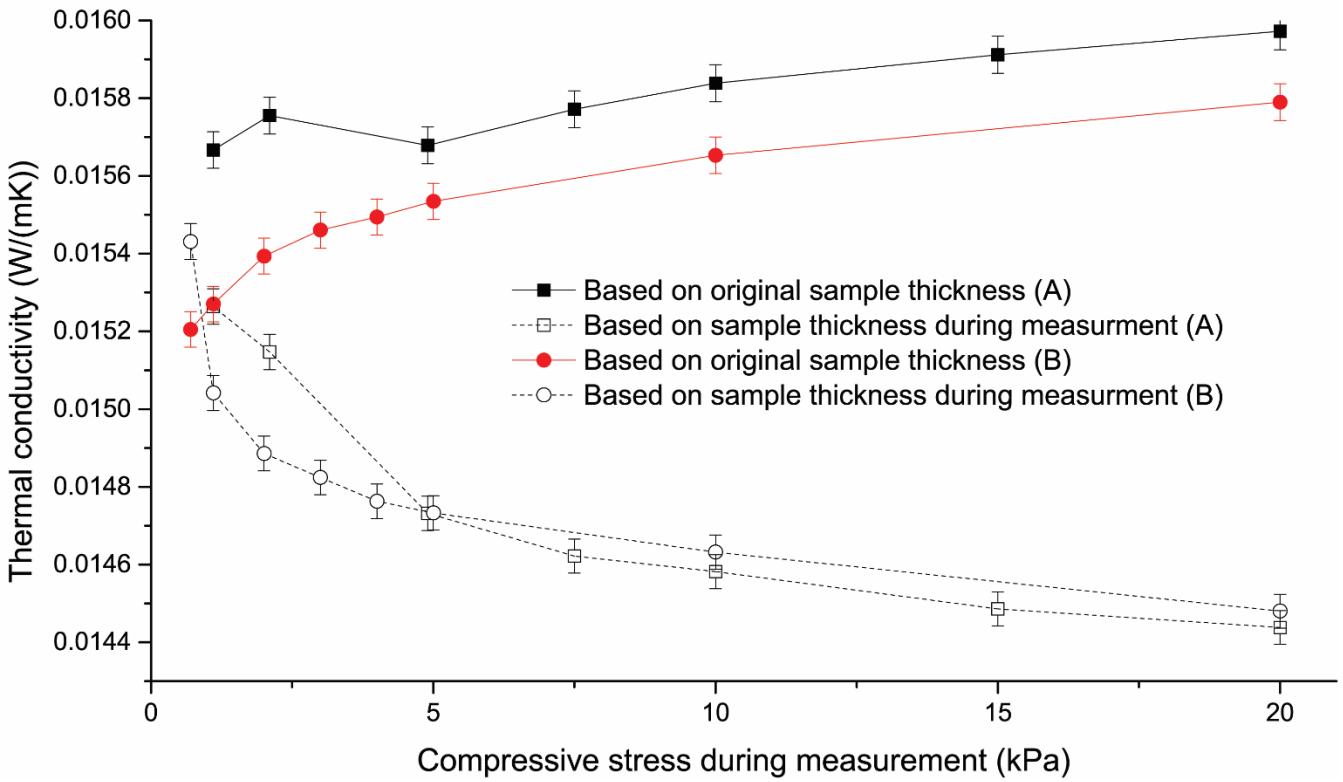
Using the nominal thickness to calculate more realistic design values for thermal conductivity



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Questions?

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Teknologi for et bedre samfunn