

Project based expansion of the application of water mist installations outside DIOM with laboratory and onsite tests



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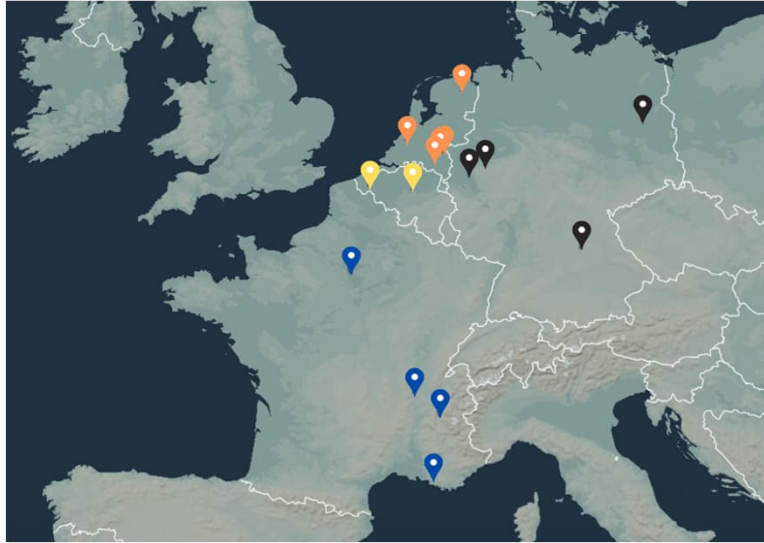


Introduction Peutz

Peutz since 1954

- Foremost consultants
- Always inclined to testing
- The two of us are based in NL
- Also in Germany, Belgium and France

Laboratories in acoustics, building physics, a wind tunnel and...
a laboratory for fire safety



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Introduction project

For a large building an additional atrium will be realised:

- Space for quiet
- Possibility for lectures
- New years assembly

Similar to adjacent spaces:
chosen for water mist
protection



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Background

The atrium is 24 x 30 x 22 m³:

- Deluge system with nozzles @ 8 m
- On opposite sides
- DIOM not applicable
- Certification required

Important consequence:

- Either a very restricted use *or*
- A live test with a polystyrene source





Objective

- *Determine whether the water mist system achieves its goal for the intended use*
 - Formulate a protocol
 - Conduct laboratory tests
 - Calculate the parameters for a site test
 - Conduct a site test





Protocol

- Determine site test in corroboration with inspection and certification body including pass-fail criteria

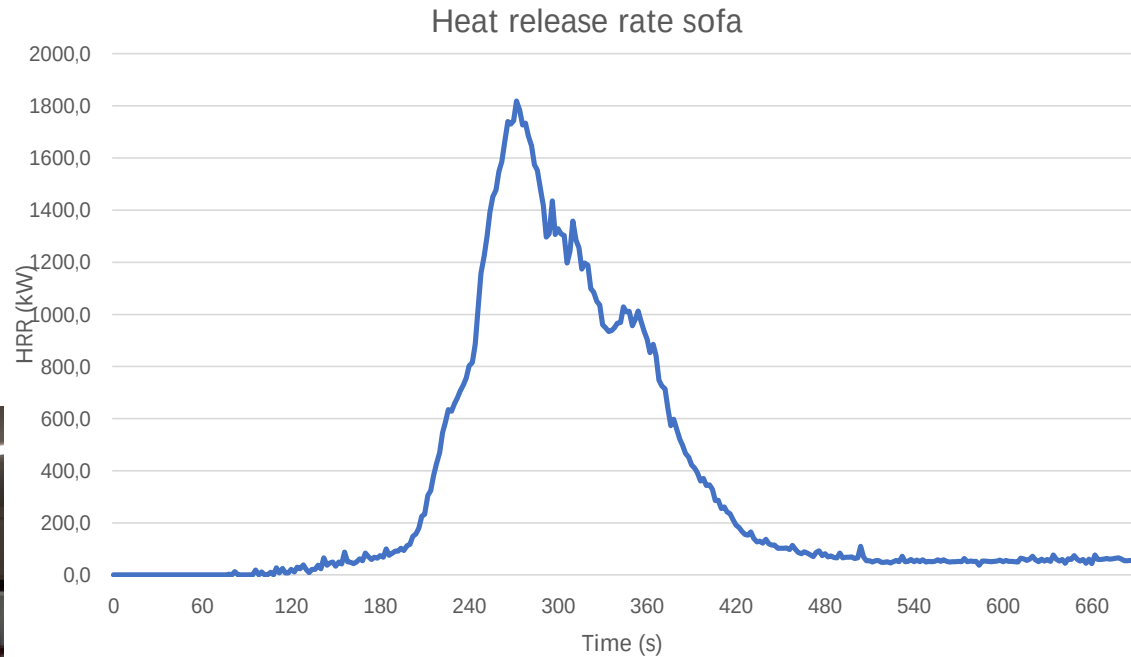
Protocol for representative site test

- Laboratory test
- Calculations
- Site test
- Pass-fail criteria



Laboratory test

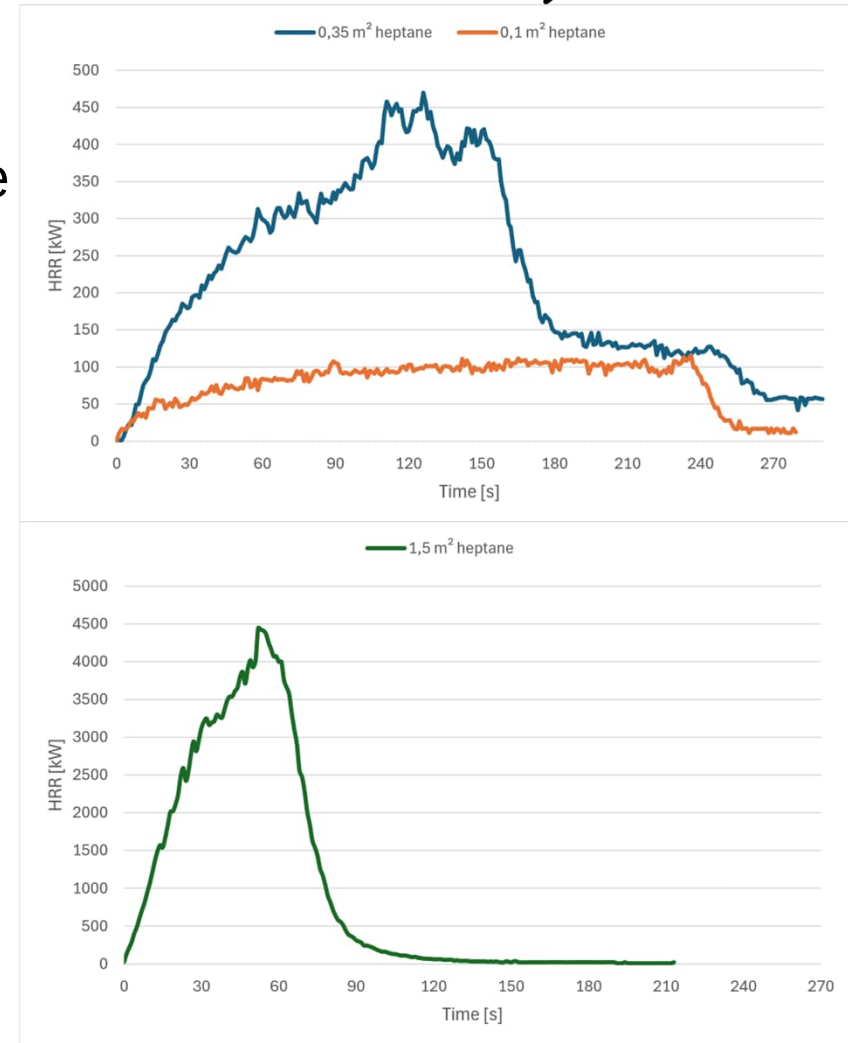
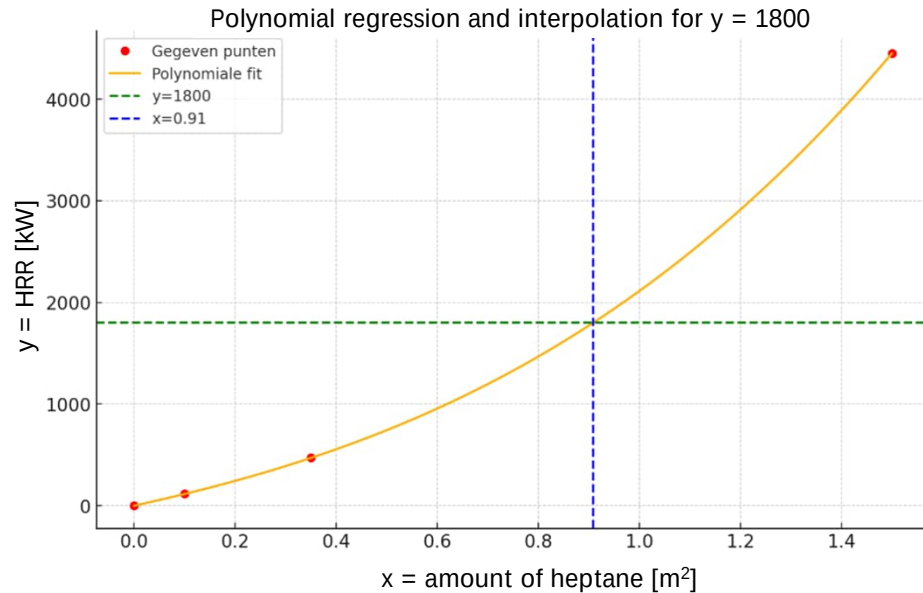
- Initial test set-up in laboratory with sofa to measure heat release rate and duration of fire





Laboratory test

- Laboratory test with 'clean' fuel heptane
→ amount of fuel 0.9 m²



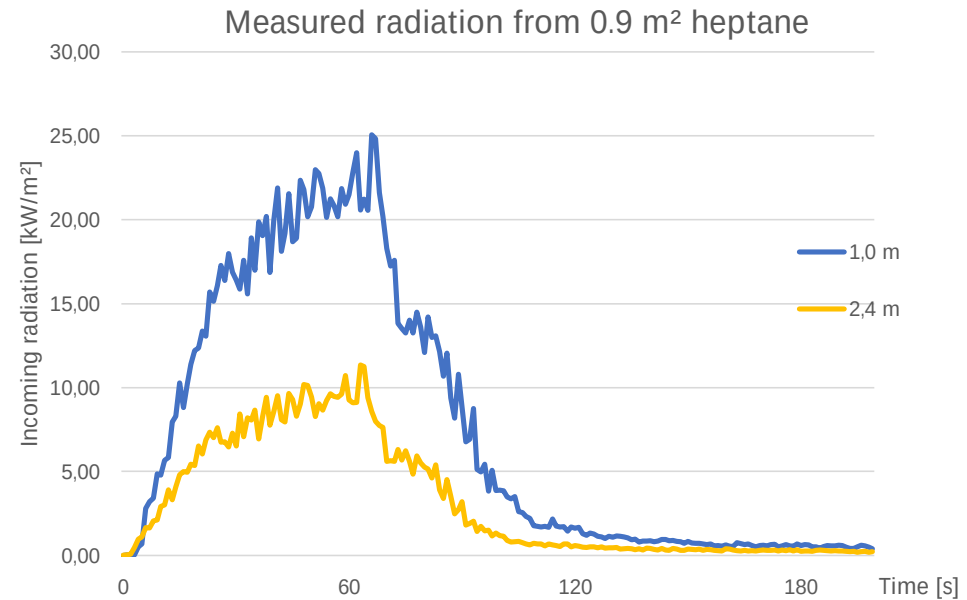


Laboratory test

- Goal: prevent fire spread in atrium
 - Radiation from 0.9 m² heptane
- pass-fail criteria site test:
- maximum of 12.5 kW/m² radiation at 1 m
 - maximum of 5.5 kW/m² radiation at 2.4 m



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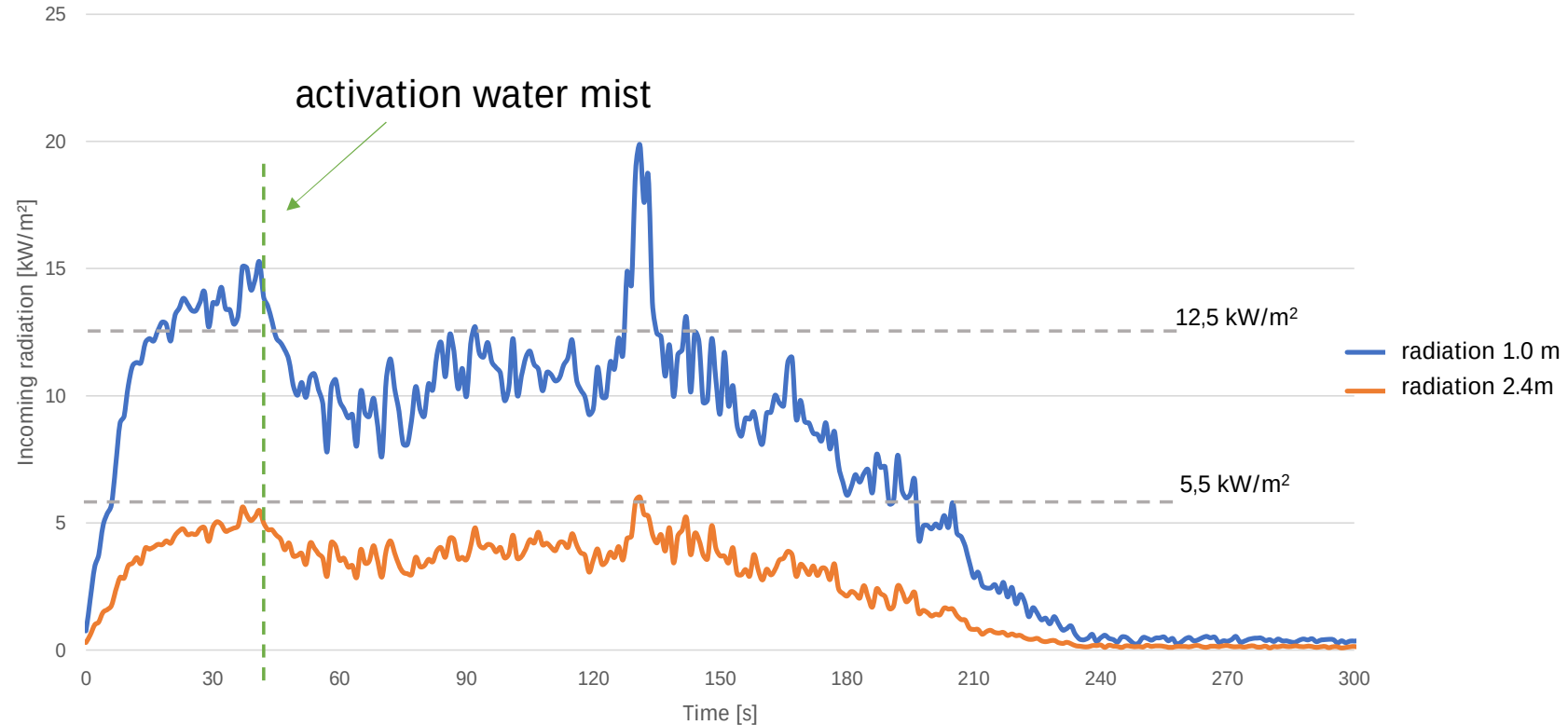
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Site test

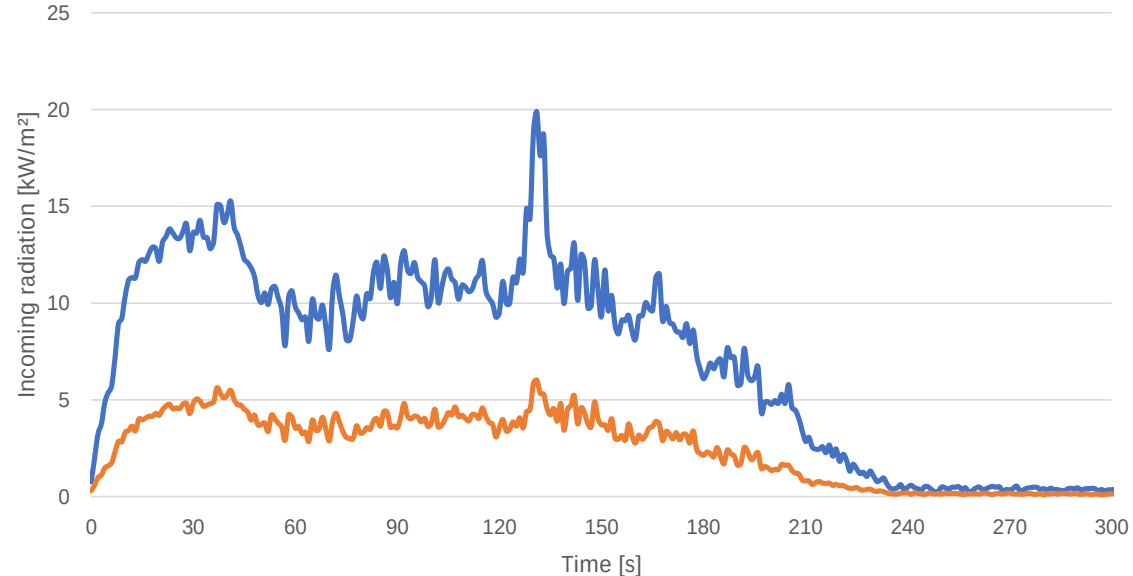
Measured radiation site test
with 0.9 m² heptane during water mist





Project conclusion

- Site test: radiation ≤ 50 % of original radiation
→ Atrium could be used as intended without unduly increasing fire risk





General conclusion

- With a set up including
 - an assessment of the objective of the installation,
 - establishing a sufficiently effective in situ test, and
 - the relative criteriaan objective estimation of the performance of the installation in the realised situation can be obtained
- Conclusions are not generally applicable, project-based evaluations will always be required

Thank you



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