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A holistic approach for fire safety requirements and design of facade systems - HOLIFAS

Recent trends with respect to energy consumption demands have increased the use of innovative façade systems both for new construction and building renovation projects. Different types of façades systems are used in order to achieve these requirements. Many of these systems are very complex and have not only fire requirements to fulfil but also other requirements for humidity, rain protection, mechanical stability, thermal insulation etc. Also, socio-technical aspects play an important role in today's overall fire safety assessment of these systems. The Holifas project addressed the fire safety of façade systems by a holistic approach taking into account all these requirements.

Objectives

The overall objective of this project was to address the fire safety requirements on external façades systems through a technical holistic approach of façade systems and from a socio-technical perspective. The aims was to identify the research gaps and research questions which need to be addressed in order to safeguard the fire safety of new and renovated buildings.

Methods

The following methods were used:

- *Literature reviews*
- *Surveys*
- *Interviews with experts (industry, researchers and regulators)*
- *Expert meetings and discussions (With industry and Swedish Building University experts)*

RESEARCH GROUP

Lunds Universitet

Meacham Associates

Briab

Experts from the Swedish Building University working group, "Technical functions of buildings"

Results

- It is important to further define a façade system
- Different façade systems exist and are not easy to categorize.
- The different technical properties and their requirements differ depending on the category of façade system.
- Façades constructions are complex systems and not single ma terials or products. Fire safety evaluation of one single material to promote or to forbid systems is not favourable.
- Before introducing test standards into regulations, regulators should identify which risk they want to reduce and choose the appropriate performance criteria or safety levels.
- A suitable test method (e.g. full scale) or a suitable performan ce-based solution based on fire safety engineering can be chosen. The latter allows full innovation.
- Existing risk analysis tools are very promising for screening of different solutions.
- A first socio-technical building regulatory system assessment mo del (STBRSAM) has been developed with promising results.
- A holistic approach for design of façade systems is necessary in the future.
- A list with future research needs were identified and these are some examples:

- A clear definition for a façade system.
- Further categorisation of façades.
- Further work on socio-technical issues and the STBRSAM is needed.
- Extended work with respect to fire behaviour of façades.
- Case-studies for overall properties of façade systems by evaluating e.g. 10-15 different façades from a scientific view point.
- Case-studies of expert evaluations from a scientific view point to learn more about the methods used.

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