LUND UNIVERSITY / DBI

FIRE TOOLS - SIMULATION OF FIRE TECHNICAL PROPERTIES OF PRODUCTS AND CONSTRUCTION BARRIERS TO SUPPORT EFFICIENT PRODUCT DEVELOPMENT IN INDUSTRY

A Short Presentation of the Research Plan

INTRODUCTION

The performance-based fire safety building regulations have been developed in several countries during the last three decades. Performance-based regulations states the objectives for the design, but does not state how it should be accomplished.

In many cases, today's fire engineers have only access to the results from presciptive tests, which evaluate performance on terms of discrete values or pass/fail criteria when the test speciment is thermally exposed to a temperature that is not related to a specific design fire. When using performance-based design it's often needed that the parameters should be given in a continious scale instead of discrete pass-fail value. Moreover it's necessary to obtain real life performance of building products, content and barriers.

It would also be a large benefit if industry would be able to obtain results of its products by means of material characteristics of its compnents.

FIRE TOOLS - METHODOLOGY

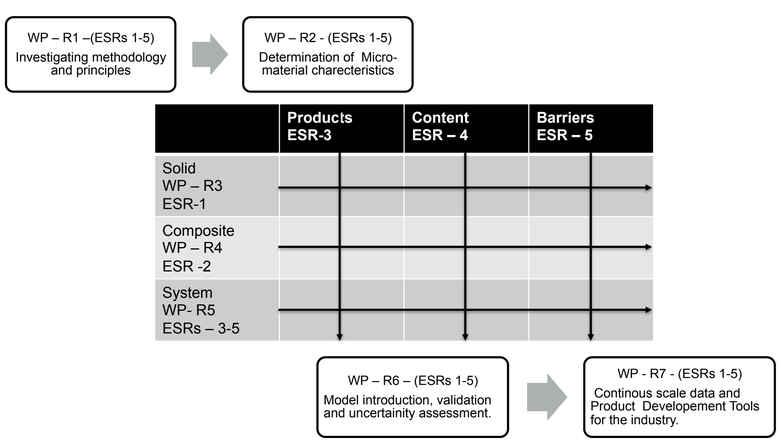

Figure 1: Research plan. Activities are organized along seven work packages (WP-R1 to WP - R7) and 3 different modeling levels.

FIRE TOOLS - OBJECTIVES

The FIRE TOOLS project will advance the state-of-the-art by developing a novel methodology to be used in performance-based fire safety design. This methodology will use the material characteristics of building materials/products, building content and construction barriers in order to obtain the overall fire course in a building, defined as the design fire. Research efforts have so far has been focused on the intermediate levels (composite and systems level). FIRE TOOLS will focus on the areas of materials characteristics (micro scale and solid material level) and the conection to real-life systems. **The overall objective of FIRE TOOLS is to provide tools to obtain fire properties of products and constructions on a continious scale by means of the material data of which they are composed.**

FIRE TOOLS - STRUCTURE

The research activities in FIRE TOOLS comprises five individual research projects.

ESR1: Development of a prediction methodology for fire behaviour of solid materials used in building products, content and barriers by means of material data at micro scale.

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ESR2: Development of a prediction methodology for fire behaviour of composite materials used in building products, content and barriers by means of solid material data.

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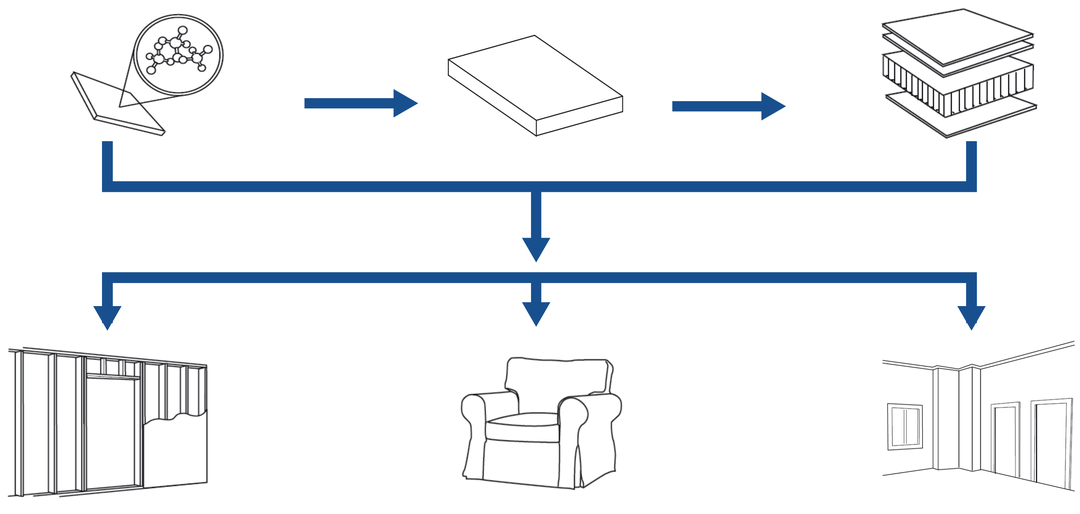

ESR3: Development of a prediction methodology for fire behaviour of building products by means of composite material data, solid material data and material data at micro scale.

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ESR4: Development of a prediction methodology for fire behaviour of building content by means of composite material data, solid material data and material data at micro scale.

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ESR5: Development of a prediction methodology for fire behaviour of building barriers by means of composite material data, solid material data and material data at micro scale.

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FIRE TOOLS is organized in cooperation between Danish institute of Fire and Security Technology (DBI) and Lund University (ULUND).

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