Fire safe furniture in a sustainable perspective

Loose furnishings, such as upholstered furniture, mattresses and textiles, are very important for the early stages of fires. Such products can be easily ignited, contribute to rapid spread of fire and produce a lot of smoke and heat when they burn. This limits the time and opportunity for evacuation and fire rescue. Fire safety and environmental considerations are important factors that are often set against each other. It is therefore important to promote the development of safe and fireproof furnishings that are environmentally friendly throughout their life cycle.

Purpose and goal

The main objective of this project has been to contribute to new knowledge about how fire safety associated with loose interior design can be improved through developing products that meet sustainability and circularity requirements. The steps taken toward achieving this objective are:

- *Gather existing information about conditions and requirements.*
- *Identify existing solutions and need for adjustments and optimi zation.*
- *Gather new knowledge through fire testing, selection of potenti al products.*
- *Suggest how fire safety of furniture and textiles can be impr ved in an environmentally, sustainable and cost-effective man ner.*

Methods and implementation

The following activities were part of the project:

- Literature review summarizes existing knowledge of today's requirements for interior design with regard to fire safety and circular economy.
- Interviews, seminars and meetings
- Experimental; fire testing of various material combinations of interest.
- Sustainability and environmental impact characterization

Results

Combining a requirement for both sustainable yet fire safe furnishing is a complex task to solve. The more complex the material combination, the more difficult to predict its sustainability, environmental impact and fire performance. Slight variations in components can potentially change the overall scoring on these factors. For furniture to be both sustainable and fire safe, there are limitations to both design (e.g. it should be possible to dismantle and recycle the individual material components) and use of materials (materials should in themselves be defined as sustainable, yet at the same time have satisfying fire performance).

The use of flame retardants makes it challenging to achieve sustainability, because products containing flame retarding chemicals are difficult to recycle.

It is difficult to control fire performance of a product over time, in a circular economy. Information may be lost, products may change by substituting or removing components and functional properties may change over time. This is especially true for products on the private market where there is less possibilities of following the product ones it has left the shop.