Technical University of Denmark

Popular science summary of the PhD thesis

PhD student	Rolff Ripke Leisted
Title of the PhD thesis	The Fire Performance of Steel-faced Insulation Panels with Stone Wool or Polymer Cores - A Scaling and Heat Transfer Study Based on Full-scale and Scaled Experiments
PhD school/Department	Department of Civil Engineering

Science summary

In Europe, the fire performance of sandwich panels with thermal insulation, as determined by small-scale tests, has been criticized for not being able to provide adequate (sufficiently precise and accurate) measures of their fire performance. A series of compartment fire experiments was conducted, and these experiments confirmed that the performance of panels with the same European classification had significantly different contributions with respect to the fire growth and compartment temperature. The hypothesised geometrically scaling of the size of the compartment was studied as a viable alternative to the small-scale regulatory tests. The size of the compartments studied were: full, half, two-fifth and one-fifth with correspondingly reduced fires. Compartments at one-fifth scale failed to reproduce the same results as measured in the half and full-scale where the scaled heat release rate, relative to its size, provided a less severe compartment fire. The results obtained from the half scale experiments matched the results from the full-scale experiments. As such, a more robust fire safety rating is obtainable with proper scaling of the test at a reduced cost compared to full-scale testing. This method of testing greatly benefits several stakeholders, such as: 1. intuitions with smaller laboratories conducting research. 2. classifying and regulatory bodies arguing for small scale tests to reduce the cost of the classification, and 3. manufactures testing their products as part of their own research and development program also at a reduced expense prior to classification testing.

Please email the abstract to the PhD secretary at the department