

Alternative fire testing method for construction elements

Research Objective

Developing a research method to predict the fire performance of building materials before the full-scale wall test AS 1530.4.

Methodology

1. A 500mm x 600mm wall system was subjected to dynamic heat flux generated by the radiant panel as shown in Figure 1.
2. Another system with the same configuration but with a size of 3000mm x 3000mm was tested as per AS 1530.4.
3. The temperatures were recorded and compared at locations as shown in figure 02.

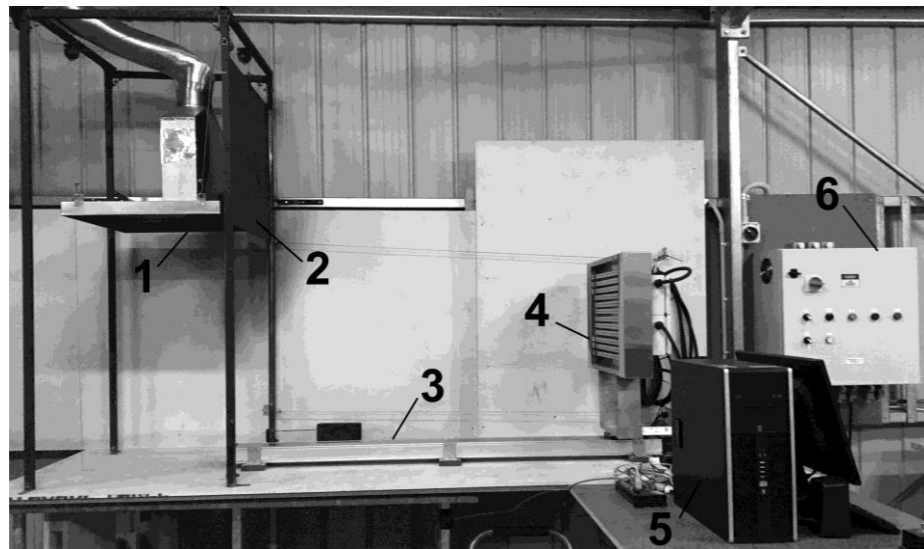


Figure 01: Variable Heat Flux Apparatus: 1) an exhaust system, 2) a shutter, 3) a linear stage 4) a radiative panel 5) a PC control system and 6) a power control box

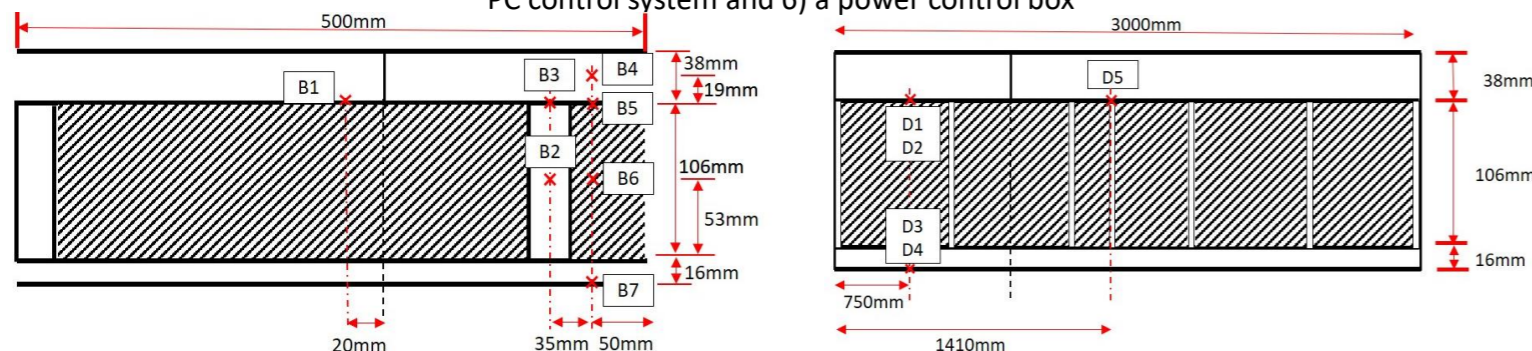


Figure 02: Cross sections of samples

Comparison

1. Relative error for all thermocouples was lower than 10%, except of the last 10 minutes of the experiment.
2. As shown in figure 04, both the samples burnt out in a more similar manner compared to the different sizes of the panels.

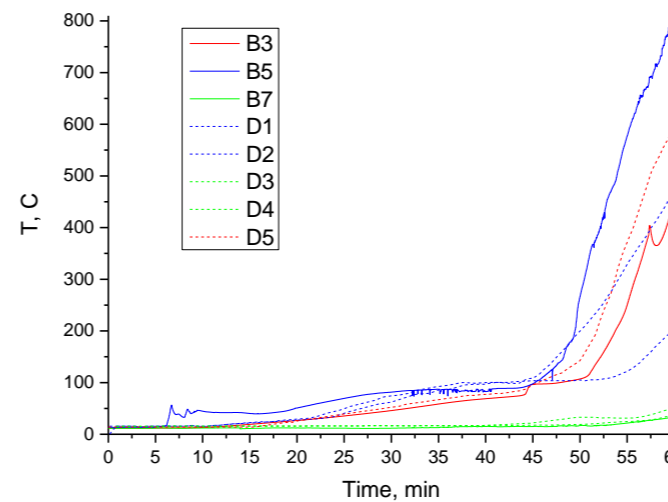


Figure 03: Comparison of temperatures in Tests VHFlux and AS1530.4.



Figure 04: The samples after the tests VHFlux and AS 1530.4

Conclusions

1. Future research is expected to carry out on the significance of thermocouple locations, the effect of insulation material and the influence of heat source.
2. The ultimate development of an improved intermediary fire test will significantly reduce the cost to manufacturers in the design and compliance phase of construction elements.

More Information

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