

Abstract

In the last few years, the implementation of well-ventilated facades in buildings increased due to their improved energy performance. However, their double-wall construction due to the limited airflow within an air cavity represents a significant fire risk, since the flames that spread into the air cavity can elongate up to five to ten times.

The main goal of this thesis is to provide additional information regarding the fire behaviour of stone wool, phenolic foam, as well as the stone wool and WRB composite, that are frequently installed materials in the well-ventilated façade systems. Their fire behaviour was initially evaluated with the cone calorimeter and then compared to the results of the intermediate scale façade tests.

The heat release rates that were obtained for the test, including the WRB and stone wool material demonstrated, that the cone calorimeter data is comparable to intermediate scale test. Based on the cone calorimeter results, the WRB and stone wool composite will have relatively quick ignition time at various heat flux values. For this reason, the WRB and stone wool could represent a fire hazard when implemented in a façade system. In addition, the intermediate scale experiments also exhibited the significance of additional parameters on the heat release rates, such as oxygen availability and the instalment of the cavity barriers.