

University of Macau

Abstract

AN INVESTIGATION OF THE USAGE OF SMALL SCALE
FURNACE FOR FIRE RESISTANCE TEST

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Fire resistance tests on non-loadbearing material are important and receive great attentions in foreign countries. Usually, tests are conducted in a so-called standard vertical furnace where a 3mx3m test material can be mounted vertically on the open surface. The fuel used by the furnace is usually propane or diesel fuel. Conditions inside the standard furnace are carefully controlled, such as pressure, and temperature. Most important of all, according to different international standard, the temperature increment needs to follow a specific “time \leftrightarrow temperature” curve. Limitations of performing the above mentioned test include [1] the test needs to be done in remote roomy area since potential hazard exist, and [2] it is necessary to built either a underground fuel tank or fuel storage room to store the fuel. Because of those limitations, it is not easy to build a full scale furnace in dense city, for example, Macau. Therefore, alternative method should be sought. The direction of this study is to explore the alternative method, which is the use of a small scale furnace to conduct fire resistance test and compare the experimental results with that from the full size furnace. After verification of the results, it shows good agreement between the tests conducted in the small scale furnace and the full size furnace.