

Prediction of quadratic fire curve considering the Increase in mass of stock-piles

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ABSTRACT

In this paper, we aimed to convert the fire curve in volume units to a fire curve per unit area for application in the Fire Dynamic Simulator (FDS) surface heat release rate method. The fire curve was expressed dimensionlessly considering the total combustion characteristic time, and improvements were made to represent the appropriate ratios for the growth, steady, and decay phases concerning the fire intensity. Additionally, a correction function for combustion characteristic time varying with mass increase was derived. Also to control the growth time values according to the increase in mass, a function to correct the growth phase ratio was derived. Consequently, utilizing existing data, a formula was established to determine the reference mass for combustion materials and predict the fire curve based on mass increase.

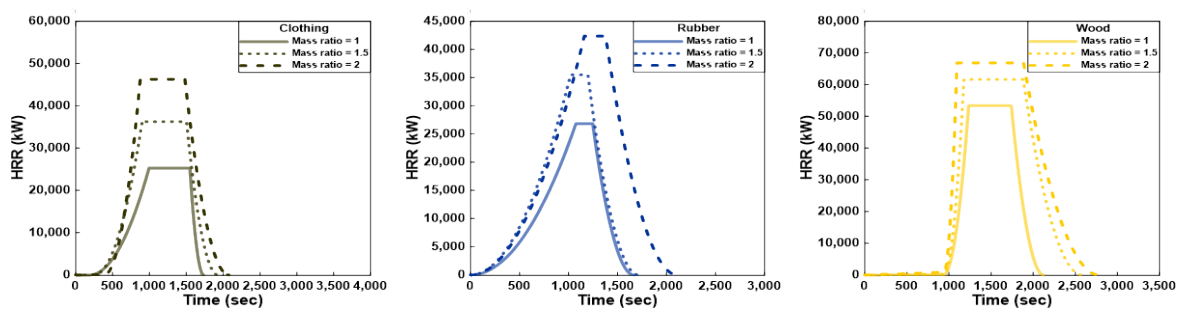


Fig. 1 Fitting results of fire curves data from the Korea Expressway Corporation

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