

Probabilistic design fires for passenger vehicle scenarios

ABSTRACT

When considering fire safety design scenarios for car parking buildings it is possible that there will be spread of fire between multiple vehicles. Such scenarios need to account for the likely rate of heat release curve from already burning vehicles as this will impact on the likelihood that other vehicles will ignite and so increase the severity of the fire. Currently design fires for a single passenger vehicle are often either given as a specified rate of heat release history or as mathematical functions with fixed coefficients irrespective of the size (curb weight) of the vehicle. In this paper, experimental results taken from the literature are used to determine a probabilistic approach to characterise a single passenger vehicle design fire. It is found that a peak fire growth function and an exponential fire decay function gives an appropriate combination in which the parameters for the two functions can be determined from distribution statistics.

Keyword: Design fire; Passenger vehicles; Heat release rate; Probability; Car parking building