大空間跨距之建築物內部火災煙霧傳輸行為數值模擬

Conventional fire and smoke control systems use pressure differences across small openings and cracks in physical barriers as a means to restrict smoke propagation from one space to another and water- spray curtains to diminish or eliminate fire and smoke. Most fire codes of United State of American depend upon the National Fire Protection Association (NFPA), guidebooks. In turn these propose the use of simple zone models that solve conservation of mass and energy in a control-volume sense for each zone. One weakness of zone modeling is that momentum conservation is only captured through use of loss coefficient at openings. The strength of zone models is that they are very fast compared with computational fluid mechanics (CFD) based models. Atria, covered shopping malls, convention centers, airport terminals, sport arenas, and warehouses are examples of large spaces for which these conventional zone-model approaches are not always effective. CFD , sometimes called "field- modeling" in the fire community to distinguish it zone-modeling, has an unparalleled potential as an engineering estimator of fire consequence in atria since it permits specification of momentum conservation as well as much finer spatial and temporal resolution of the fire physics. In addition CFD approaches provide a link between outside building weather conditions and fire and smoke development. This paper will discuss the results of calculations for an example building atrium based on zone (ASMET) and field (FLUENT and FDS CFD)-based models.