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Title: Research on fire-resistance capacity of composite beams with considering structural integrity

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关键词: [组合梁](#); [抗火性能](#); [悬链效应](#); [理论研究](#); [性能设计](#)

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摘要: 处于结构整体中的构件具有比单个构件更高的抗火能力,这已在Cardinton试验以及一些火灾现象中得到了证实。由于结构的高次超静定,组合梁在火灾下达到其极限抗弯承载能力后,尚能够利用悬链线效应继续承载。通过理论和试验研究,给出了考虑结构整体性的组合梁火灾全过程计算方法。利用这种方法,可以计算组合梁挠度、轴力、跨中及梁端弯矩的变化全过程,进而对组合梁的抗火性能进行火灾全过程分析。通过试验,验证了这种理论计算方法的可靠性,为组合梁抗火性能的理论研究和抗火设计提供了参考。

Abstract: The previous fire test of steel beam has revealed that the fire-resistance capacity of restrained beam would be higher than that of isolated beam because of catenary action in performance-based fire design. The object of this paper is to study the catenary action of composite beam and effect of neighbouring substructure on the composite beam when temperature elevated. Based on the analysis of the stiffness, calculation method of axial force and moment at the middle span and end with considering the effect of temperature elevation, a theoretical method for assessing the fire-resistance capacity with considering the restraint is provided in this paper. The method would help the fire engineers to understand the real performance of composite beam in fire and then to implement the fire design of the beam. The fire test of restrained composite beam shows that the catenary action would enhance the fire-resistance of composite beam. This would lead to less fire-protection. The comparison between the theoretical results and the test results reveals the reliability of the

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