

Thesis Abstract cohort 2012-2014
The International Master of Science in Fire Safety Engineering

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Strategies for egress from trains on fire in ventilated tunnels

This thesis focuses on strategies for egress from burning trains in tunnels for immediate stop situations where no rescue station can be reached. There is a general debate among fire engineers, fire service personnel and tunnel operators about different egress strategies and how to facilitate the tunnel ventilation in emergency situations.

The main goal was to rank different egress options and to provide qualitative guidance on feasible egress options in ventilated tunnels.

The analysis is based on CFD simulations and a toxicity model, capable of predicting the fire effluents data and its effect on passengers, respectively.

Based on this research's findings, forced airflows in combination with simultaneous evacuation should only be used when the fire is located on the power car or the first adjacent carriage. In case the fire is located in intermediate carriages or if the fire's location is unknown, no forced airflows should be introduced. No general recommendation could be made for phased evacuation processes, as tunnel specific decisions between tunnel operators and train manufacturers have to be made regarding the feasibility of these processes.
