

Temperature stratification in tunnels

Fire Protection in Transportation

We are building more and more underground facilities and tunnels in Sweden. The need for knowledge regarding fire situations is great.

The purpose of the project is to validate a simplified method to determine the nature of the temperature stratification using data from a number of already performed full scale and model tests. A method using of previously established correlations between gas temperature distribution and smoke stratification in mines has been used for tunnel applications. The investigated correlations are based on excess gas temperature ratios and Froude number scaling.

The report describes a comparison between two large scale tests (the Memorial tunnel and Runehammar tunnel) carried out in a road tunnel and two well defined model scale tests.

A good correspondence between the experimental data and the correlations was found when the gas temperature data was used. However, the correspondence between the previously established correlation of gas temperature stratification and Froude number, did not work very well. It is postulated that the main reason may be the way the experiments were carried out. New correlations between the temperature stratification and the Froude number are also explored.

Report

Read more in the report "Temperature stratification in tunnels". The report can be downloaded from www.brandforsk.nu, project number 401-091.

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