



Tests to investigate explosive spalling of concrete lining exposed to fire

Radim Cajka

Associate professor
VSB-Technical University
Ostrava, Czech Republic
radim.cajka@vsb.cz

Radim Cajka, born 1961, received civil engineering degree from the Brno University of Technology in 1986. In the field of theory of structures he received PhD degree in 2000, habilitation in 2002. Head of the Department of Building Structures, VSB, since 2005.

Pavlina Mateckova

Lecturer
VSB-Technical University
Ostrava, Czech Republic
pavlina.mateckova@vsb.cz

Pavlina Mateckova, born 1975, received civil engineer degree from the VSB-TU Ostrava in 1999, PhD degree from the VSB TU Ostrava, in the field of theory of structures, in 2005. Lecturer at Department of Building Structures until now.

Petr Kucera

Lecturer
VSB-Technical University
Ostrava, Czech Republic
petr.kucera@vsb.cz

Petr Kucera, born 1976, received safety engineer degree from the VSB-TU Ostrava in 2002, civil engineer degree from the VSB TU Ostrava in 2006. Lecturer at Department of Fire Safety until now.

Summary

In the paper the lab tests are described. Cubes made of concrete with different types of fibres were exposed to high temperatures and then the water infiltration was measured. The results of lab tests will be used for numerical analysis of tunnel lining fire resistance with respect to danger of explosive spalling.

Keywords: lab testing, fibre concrete, heat exposure, water infiltration

1. Introduction

The attention of safety engineers has been focused on the fire safety analysis of tunnels recently. Safety engineers endeavour to improve fire-resistance of both structures and the technological equipment.

The fire resistance of common building structures is appointed generally for standard time/temperature curve according to ISO 834. On the other hand a series of time/temperature curves for the various exposures in tunnels have been developed in different countries in Europe and are used for the evaluation of the fire resistance of tunnels and underground spaces generally. The time/temperature curves for tunnel fire exposure are specific with very rapid temperature rise within 5-10 minutes, Fig. 1.

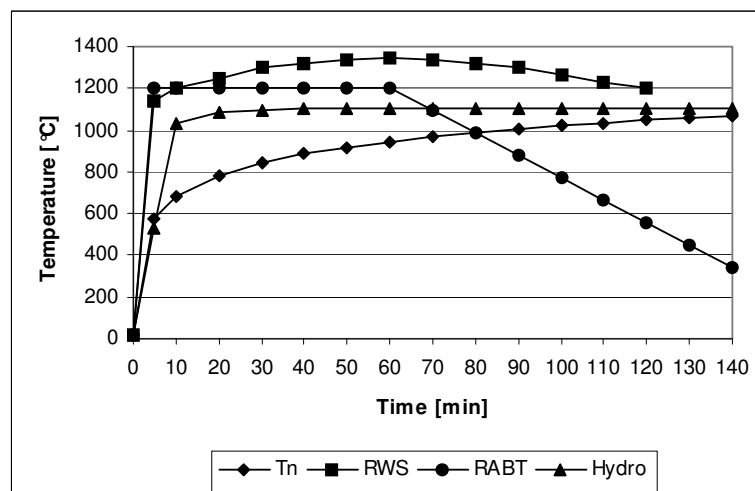


Fig. 1: Time/temperature curves