

# **PREDICTION OF CONCRETE MASS LOSS DUE TO FIRE USING UNIAXIAL COMPRESSION TEST**

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## **ABSTRACT**

Several types of concrete, having different water/binder ratio and porosity, have been investigated in the past decades. Most of the experimental campaigns were carried out to judge the strength of concrete, or, separately, the fire spalling resistance. Studies on both these properties, and on the fracture toughness in compression as well, are very scarce in the technical literatures. We believe that this detailed study, dealing with the effect produced by the water/binder ratio and by porosity on the mechanical performances in compression and fire spalling, is being carried out for the first time and will be very useful to concrete technology. Indeed, the prediction of the fire spalling will be possible by means of the sole uniaxial compression tests, and the amounts of artificial voids and polypropylene fibers can be optimized to prevent fire spalling (also in the case of the lower water/binder ratio).

**Keywords:** Concrete, water/binder ratio, fire, mass loss, uniaxial compression test.