

# **RESISTANCE OF HIGH-QUALITY CONCRETE (HQC) TO CHLORIDE ION PENETRATION**

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## **ABSTRACT**

A research program was carried out to evaluate the chloride ion permeability of both air and non-air entrained concretes made with mineral admixtures as partial replacements of cement. Two series of investigations (Series 1 and Series 2) were carried out. The mixtures were proportioned to have 28-day strengths of 35 MPa for Series 1 and 69 MPa for Series 2. Chloride ion permeability was determined in accordance with ASTM C 1202. Series 1 mixtures contained a Class C fly ash whereas Series 2 mixtures contained the fly ash and silica fume. In general, all the concrete mixtures, with or without mineral admixtures, exhibited low values of chloride ion permeability. In this work, a concrete containing 37% Class C fly ash showed results comparable to a concrete containing 11% Class C fly ash plus 8% silica fume with respect to chloride ion permeability. The chloride ion permeability of high-quality concrete system was found to be unaffected when silica fume concentration was increased from 8% to 11%.