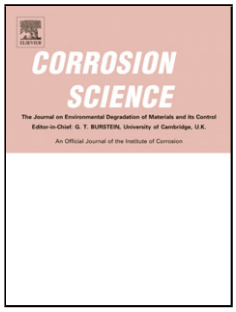

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PII: S0010-938X(15)00216-4
DOI: http://dx.doi.org/doi:10.1016/j.corsci.2015.05.021
Reference: CS 6308

To appear in:

Received date: 27-11-2014
Revised date: 11-5-2015
Accepted date: 12-5-2015

Please cite this article as: Carlos G. Berrocal, Ingemar Löfgren, Karin Lundgren, Luping Tang, Corrosion initiation in cracked fibre reinforced concrete: influence of crack width, fibre type and loading conditions, *Corrosion Science* (2015), http://dx.doi.org/10.1016/j.corsci.2015.05.021

Corrosion initiation in cracked fibre reinforced concrete: influence of crack width, fibre type and loading conditions

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Abstract

This paper reports results from an ongoing project aimed at investigating the influence of fibre reinforcement on corrosion of rebar in chloride environments. Material tests showed that the resistivity of concrete decreased with the addition of fibres, whereas the chloride migration coefficient remained unaffected. Fibres at low dosages (<1.0% vol.) did not significantly affect the compressive and flexural strength of concrete but greatly enhanced its toughness. The results from corrosion tests showed a tendency of an earlier initiation of corrosion with increasing crack widths, while a small improvement was observed by the addition of fibres in terms of delayed corrosion initiation.

Keywords: A. Steel reinforced concrete, C. Atmospheric corrosion

1. Introduction

Today, corrosion of reinforcement remains a major problem affecting the durability of reinforced concrete structures, in which chloride ingress is one of the primary causes [1]. In corrosion terms, the service life of a reinforced concrete (RC) structure can, generally, be divided into two periods of time: initiation and propagation [2]. The initiation period is considered the time required by external agents to penetrate into the concrete and cause the depassivation of the reinforcing steel. The propagation period is characterized by active corrosion, with associated steel loss of cross-sectional area of the bars and the

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