Accepted Manuscript

Influence of recycled tire polymer fibers on concrete properties

Ana Baričević, Marija Jelčić Rukavina, Martina Pezer, Nina Štirmer

PII: S0958-9465(18)30116-1

DOI: 10.1016/j.cemconcomp.2018.04.009

Reference: CECO 3045

To appear in: *Cement and Concrete Composites*

Received Date: 31 January 2018

Revised Date: 9 April 2018

Accepted Date: 16 April 2018

Please cite this article as: A. Baričević, M. Jelčić Rukavina, M. Pezer, N. Štirmer, Influence of recycled tire polymer fibers on concrete properties, *Cement and Concrete Composites* (2018), doi: 10.1016/j.cemconcomp.2018.04.009.

Influence of Recycled Tire Polymer Fibers on Concrete Properties

Ana Baričević[1*], Marija Jelčić Rukavina[1], Martina Pezer[1], Nina Štirmer[1]

[1] University of Zagreb Faculty of Civil Engineering, Department of Materials, Fra Andrije Kacica Miosica 26, 10 000 Zagreb, Croatia; abaricevic@grad.hr, jmarija@grad.hr, mpezer@grad.hr, ninab@grad.hr

*Correspondence: abaricevic@grad.hr; Tel.: +385-1-4639-536

Abstract: This paper presents an experimental study of recycled tire polymer fibers (RTPF) used as a replacement for polypropylene fibers, evaluating the contribution of the cleaning procedure and defines the benefits for RTPF application in concrete. The density, air content, workability, heat of hydration, early age deformations, development of compressive strength, modulus of elasticity and freeze-thaw resistance of hardened concrete were tested. It was found that both, mixed and cleaned RTPF can be used in concrete production independently of its rubber contamination level. Up to 10 kg/m3 of mixed RTPF and up to 2 kg/m3 of cleaned RTPF did not negatively influence the mechanical properties of concrete. It was concluded that RTPF enhanced concrete behavior during the early age and when exposed to the aggressive environments.

Keywords: *recycled tire polymer fibers; concrete; early age deformations; freeze-thaw resistance*