

Crack Opening Investigation in Fiberconcrete

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Abstract : Work has three stages. In the first stage was examined pull-out process for steel fiber was embedded into a concrete by one end and was pulled out of concrete under the angle to pulling out force direction. Angle was varied. Length of steel fiber was 26 mm, diameter 0.5 mm. On the obtained force- displacement diagrams were observed jumps. For such mechanical behavior explanation, fiber channel in concrete surface microscopical experimental investigation, using microscope KEYENCE VHX2000, was performed. Surface of fiber channel in concrete matrix after pull-out test (fiber angle to pulling out force direction 70°). At the second stage were obtained diagrams for load- crack opening displacement for breaking homogeneously reinforced and layered fiber concrete prisms (with dimensions 10x10x40 cm) subjected to 4-point bending. After testing was analyzed main crack. On the main crack's both surfaces were recognized all pulled out fibers their locations, angles to crack surface and lengths of pull-out fibers parts. At the third stage elaborated prediction model for the fiberconcrete beam, failure under bending, using the following data: a) diagrams for fibers pulling out at different angles; b) experimental data about steel-straight fibers locations in the main crack.

Keywords : fiberconcrete, pull-out, fiber channel, layered fiberconcrete

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