Material Properties of Ductile-Fiber-Reinforced Cementitious Composite

by

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Abstract

Recently, the research and development of ductile-fiber-reinforced cementitious composites (DFRCCs) that are superior to existing ones has been actively conducted. DFRCC is a cementitious composite material reinforced with fibers, and it exhibits crack dispersing properties under tensile, flexural or compressive stress. Consequently, DFRCC is a material with high ductility under flexural, tensile or compressive failure. The use of DFRCC as an energy absorbing material will be one of the applications to reduce the seismic response of a structure. Using DFRCC instead of concrete will also enhance the durability of reinforced concrete (RC) structures. To apply DFRCC to RC structures, it is needed to clarify the material properties (such as shrinkage, creep, and strength development) of DFRCC. In order to evaluate the material properties of DFRCC, shrinkage, creep, strength development, and cyclic loading tests were carried out. This paper presents the conclusions that the equation proposed in this study can be used to estimate the strength development of DFRCC, and the present hysteresis model is applicable to predicting the hysteresis of DFRCC under cyclic stresses.

Keywords: Shrinkage, Creep, Strength development, Cyclic behavior, FEM

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