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Investigation of nanofibers in the interfacial transition zone of concrete JAHI PALMER, SHANE PALMQUIST, LINDA CRUZ, KEITH ANDREW, EDWARD KINTZEL, Western Kentucky University — Mechanical properties of concrete are most commonly determined using destructive tests including: compression, flexure, and fracture notch specimen tests. However, nondestructive tests exist for evaluating the properties of concrete such as ultrasonic pulse velocity and impact echo tests. One of major issues with concrete is that unlike steel it is quasi-brittle material. It tends to want to crack when tensile stresses develop. These cracks generally develop at the interfacial transition zone (ITZ) between the cement paste and the aggregate. Fibers have been added to concrete for many years to help with temperature and shrinkage cracks. In more recent years, the concepts of adding fibers with enhanced properties such as carbon and glassy nanofibers (NFs), to concrete have been explored. Some possibilities include developing concrete that may be more durable, flexible, stronger, less permeable, and potentially "crack free" than traditional concrete. Based on SEM images and quantitative data taken using the Large Chamber Scanning Electron Microscope at Western Kentucky University, this study examines the ITZ of concrete made with NFs. Results provide greater understanding on the nature of the ITZ region in concrete made with NFs.

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