

DRYING SHRINKAGE BEHAVIOR OF METAKAOLIN-BASED AND BAMBOO FIBER REINFORCED GEOPOLYMERS

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This Brazil-USA collaborative research uses bamboo cultivated in the Amazon region and metakaolin attained from calcined Amazonian kaolin. The durability of sustainable geopolymer materials is studied by means of the drying shrinkage aging behavior. Scanning electron microscopy and energy dispersive x-ray fluorescence were used to investigate the microstructure of the composite materials. X-ray diffraction was used to confirm the formation of geopolymer. The water treated geopolymer matrix (GP) samples dried at room conditions for the periods of 3-7-14-21-28-56-112 days showed very close and increasing weight and length changes. The GP reinforced with bamboo fiber (GPBF) treated samples weight and length changes increased from the 3-day sample up to the 21-day, then it dropped down to the 112-day. The GP water treated samples dried at room conditions for the aging periods showed increasing flexural strength (MOR) and modulus of elasticity (E). The GPBF treated samples MOR were higher and very close to each other.