Abstract

The objective was to evaluate the addition of sepiolite in fiber cement sheets, aiming to observe its effects in the fresh state behavior, such as solids retention and rheology, as well as in the mechanical and physical performance of the final product. Sepiolite, produced and supplied by Tolsa (Madrid, Spain), is a natural clay mineral composed of hydrated magnesium silicate with a fibrous structure. In fiber cement, it acts as a water absorption agent and consistency modifier, helping to control the fluidity and stability of the cementitious composites, and positively altering their flexural behavior and dimensional stability. The sepiolite samples were initially characterized using X-ray fluorescence (XRF), thermogravimetry (TGA), X-ray diffraction (XRD), and surface area analysis (BET method). Flat fiber cement sheets were produced on a laboratory scale using a slurry dewatering and pressing method, a crude reproduction of the Hatschek industrial process. Fresh and air-cured samples will be analyzed across three levels of limestone to sepiolite substitution, alongside a reference formulation commonly used for roofing applications. Fresh fiber cement materials will be evaluated using fast sedimentation tests and the Squeeze-Flow rheological technique, while hardened materials will undergo microstructural analysis and physical, mechanical and dimensional stability testing. The inclusion of sepiolite improved material consistency, helping to control the water/cement ratio after pressing and moldability, avoiding the formation of latent defects; and consequently, enhanced the fiber distribution and adhesion to the cementitious matrix, with a positive effect on the physical and mechanical performance of the final product.