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RECYCLING TEXTILE RESIDUES INTO CEMENT COMPOSITES

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Abstract

Changing wastes into raw materials is one of the most favored options for waste management, as it diverts wastes from landfill and saves resources. Fibers, either vegetable (cellulosic) or synthetic, may be added to cement pastes in order to improve the properties of concrete or mortar by reinforcement. At the same time, if the source of fibers is wastes, then such processes make ways for recycling. In the work described here we studied the compatibility of residues from the nonwoven textile industry with Portland cement, with the aim of manufacturing reinforced fiber-cement composites. The methodology was based on the monitoring of the temperature of cement setting, and when fiber or other materials were added to cement pastes. Results showed that the textile waste from needling machines investigated here is not compatible with cement. The reason is ascribed to a higher cotton content (65%), which enables cation exchange to occur in cement suspensions, and that disturbs cement setting reactions. On the other hand, however, synthetic fibers do not seem to hinder cement setting.

Key words: cement, compatibility, recycling, textile, waste

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