

DEVELOPMENT OF MANUFACTURING TECHNOLOGY FOR LOW-COST, HIGH-PERFORMANCE, BLENDED CEMENTS IN WISCONSIN

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ABSTRACT

Portland cement is the most costly and energy intensive ingredient used in the production of concrete. There are several industrial by-products currently available which can be used to supplement portland cement, such as fly ash, slag, rice husk, silica fume, etc. These materials can be used in manufacture of cement with little or no additional processing. The resulting material is termed as blended cement. The use of blended cement in concrete and other cement-based materials not only provides economic, energy savings, and ecological benefits, but also provides improvement in properties of materials incorporating blended cements.

The major aim of this investigation is to develop blended cement technology using industrial by-products. This report presents only state-of-the-art information pertaining to the production technology of blended cement. The report includes information on constituent materials and manufacturing processes, and performance characteristics of blended cements made with various supplementary materials as well as chemical additives.

Previous test data have revealed that industrial by-products such as fly ash, slag, silica fume, etc. are suitable for use in production of blended cements. Performance of these materials can be enhanced through further processing and/or additions chemical activators.