

**DEVELOPMENT OF MANUFACTURING TECHNOLOGY FOR LOW-COST, HIGH-PERFORMANCE BLENDED CEMENT IN WISCONSIN
VOLUME II: EXPERIMENTAL INVESTIGATION**

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ABSTRACT

Despite the well-known economical, technical, and environmental benefits achieved by the use of the blended cements, its production has been slow to develop in the U.S.. The major aim of this project was to establish blended cement production technology through laboratory investigations. This involved production and evaluation of blended cement in the laboratory, in order to define materials, proportions, and production techniques that could be adopted by cement producers.

The test data showed that it is possible to produce low-cost, high-performance blended cements with large amounts of industrial by-products. This research further confirmed that industrial by-products can be used to produce blended cements which provide superior strength gaining properties and improved economy compared to ASTM Type I portland cement. For equal performance, blended cements were found to provide material cost savings of up to 33% compared to portland cement. Blends providing equivalent early-age strength and higher later-age strengths were produced with a 30% materials cost savings. The results further showed that it is possible to produce blended cements with low early-age strength but equivalent later-age strength in order to reduce cost of materials by up to 45%. Blends providing increased early-age strength were also produced. These blends yielded material cost savings of less than 20%.