National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Study on the Interaction of Additives and the Bond Phase Components in Deflocculated Castables
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Venue	: Ceramic Department Seminar Room
Date and Time	: 30 Jan 2025 (4.30 PM)
Abstract	: The matrix components - filler, cement, additives - of deflocculated castables interact, exhibit castables' desired rheological and hardening performance, and develop strength due to the cement hydration reaction. Most of the time, the interaction is affected by the matrix components and significantly deteriorates the performance of the castables. This study identifies the factors affecting the interaction and how they affect the hydration reaction. This study also identifies the factors for high wetting time and mixing time. Three techniques - Exothermic Profile, Ultrasonic Velocity, and Conductivity Profile - were applied to assess the hydration characteristics of different castables with a combination of different matrix components. The pore solution of the castable paste solution with a specific interval was extracted to check the soluble ions, and those helped to understand the interaction between the matrix components. High wetting time was in the agglomerated microsilica-containing castables less agglomeration was in the high alkali-containing microsilica. Very little flow, long working time, and significantly longer peak time developed zero six-hour strength in the castables with high impurity containing microsilica. Very high wetting time, longer peak temperature time, and relatively lesser six hours strength were in a fine-based castable compared to the remaining fine-based castables, and the behavior was opposite in a castable with similar alumina containing fine. Alumina with multimodal PSD helped to reduce the wetting time. The variation of alumina affected the initial flow, T30 flow, exothermic peak temperature, and the time of peak formation of microsilica-based deflocculated castables. However, the variation of alumina did not affect the initial flow of microsilica-free castables, although a significant variation was in workability, exothermic peak time, strength development time, and six hours strength.