

Aggregate Moisture Content and Fresh Property Control Measures in Cementitious Mortars

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Abstract - A primary objective for any concrete, or other cementitious composite, is to ensure consistent, reliable, and predictable fresh properties between subsequent batches. This is especially important for additive manufacturing, grouting, and pumping applications, where regulation of the fresh properties is paramount to providing quality control. This study considered the main influences of aggregate moisture content and how that moisture is accounted for during batching on the flow, setting time, and compressive strength of a mortar currently used in an additive manufacturing process. The results indicated that aggregate moisture content can drastically alter the variability in these properties. When fresh properties need to be controlled for a mortar, it is recommended that the aggregates should be saturated surface dry, or at least partially saturated, and that the moisture should be properly accounted for by adjusting the batching proportions. This recommendation is based on the results in this study with the lowest amount of variability and therefore the greatest amount of reliability and consistency.

Keywords: mortar, aggregate, workability, setting properties, moisture content, mortar flow