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# Glassy particles as an active component in cementitious materials for the future

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5% of the global $CO_2$ emissions from human activity come from the production of Portland cement clinker (PCC), the major constituent in Portland cement. This work focuses on reducing this $CO_2$ emission by replacing PCC with suitably reactive glass particles. We attempt to find the optimum composition of the particles with respect to e.g. limestone consumption and melting temperature. In this work, we investigate pozzolanic reactivity of the glass, i.e., the ability of the glass to participate in the strength developing reactions taking place during cement hydration. The pozzolanic reactivity is tested as the reactivity of the glass in a saturated $Ca(OH)_2$ solution which reproduces the conditions in a cement paste. Compressive strength is tested for mortars with 30 wt% substitution of cement with glass particles or with a mixture of glass and limestone. In general, promising strengths are observed for these blended cements. Mortars containing both glass and limestone exhibit the highest strengths.

Key word
Supplementary cementitious materials
CO2 emission
Pozzolanic reactivity