

Polymer Modification of Masonry Cements in Brick Masonry

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Abstract:

The effects of four polymers and two superplasticizers, demonstrated to provide high flexural bond strengths in portland cement-lime mortars, were investigated in combination with three grades of masonry cements. A specially designed loading sleeve was used to test for flexural strength. The results conclusively show that polymer-modification increases the flexural bond strength of masonry cement mortars in brick masonry. A mortar containing the polymer Rhoplex MC-1834 in combination with the superplasticizer Rheobuild 1000 achieved an average flexural bond strength four times that of the unmodified type M masonry cement control mortar. The best performing polymers were Rhoplex MC-1834 and Airbond CP-67, although Neocryl A-1044 also performed well but inconsistently. These three polymers are all acrylic latexes. The fourth, Airflex RP-245, is a vinyl acetate/ethylene powder, and consistently yielded lower bond strength, though still producing flexural bond strengths twice that of the controls. Compressive strength test results for polymer-modified mortars were somewhat erratic. Compressive strength was either improved or unaffected by polymer modification. In a few cases, the strength increases were as much as 50%. The type of masonry cement, M, S, or N, did not have a consistent effect on flexural bond strength of polymer-modified mortars.

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