







# Microstructure tests, flow, and mechanical behavior of polymerized cement mortar


Ahmed Salih Mohammed<sup>a</sup>  , Wael Mahmood<sup>b</sup> , Warzer Sarwar Qadir<sup>c</sup> ,  
Kawan Ghafor<sup>d</sup> , Rawaz Kurda<sup>e,f</sup>  


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## Abstract

The influence of two types of polymeric admixture on the stress–strain ( $\sigma$ - $\epsilon$ ) behavior of cement mortar is discussed in this article. The characteristics of cement mortars modified with two types of polymeric admixtures containing 0.20 percent (% wt.) were investigated. For early age (1 day) and 28-day curing periods, the  $\sigma$ - $\epsilon$  behavior of modified cement mortar with polymeric admixtures was investigated. Depending on the polymeric structure and content, adding polymeric admixture reduced the water/cement ratio (w/c) by 14.5 to 25.5%. When 0.20% of polymeric admixture was added to cement mortar, the compression strength improved by 72% to 153%. The cement mortar samples became brittle as the polymeric admixtures content increased. The amorphous gel fills the spaces between cement particles and sand particles, decreasing voids and porosity and improving the density of the cement mortar. To forecast the connection of the modified cement mortar with polymer, the nonlinear Vipulanandan p-q equation was used, and it was compared to the Farazdaghi- Harris-YD and Sinusoidal models. The compressive stress–strain models were evaluated using statistical methods, and