

# The bonding capability of epoxy-coated reinforcement at elevated temperatures

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## Abstract

The major concern of this research project is to deal with the bonding capability of epoxy-coated steel reinforcing bar in concrete with different bar size, coating thickness and embedment length at elevated temperature. The bonding force, slip displacement and failure mode were measured and observed in the pullout tests executed at different temperatures.

From the test results, it is found that the bonding capability of the regular steel bar decreases due to the strength loss of concrete caused by elevated temperature exposure while the bonding capability of the epoxy-coated reinforcement decreases due to not only strength loss problem of concrete but also the thermal transition and the thermal decomposition phenomenon of epoxy coating. The results of this research show that in an elevated temperature environment, the epoxy coated reinforcement loses most of its bonding strength as the central temperature reaches 100 centigrade while the bonding strength of regular steel bar doesn't degrade that much. It implies that the bonding strength of the epoxy coated reinforcement drops much more rapidly than the bonding strength of the regular steel bar as temperature is elevated. The results also show that the epoxy coated reinforcement with thicker coating has lower bonding capability.

Keyword: epoxy coated reinforcement, bonding strength, failure mode, slip displacement.