

Preparation Method and Service Condition Effects on the Performance and Durability of Epoxy Adhesives Used in Structural Timber Repairs

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ABSTRACT

Rehabilitation/restoration systems involving structural adhesives represent an efficient method for the repair and/or reinforcement of both new and existing timber members. Epoxy adhesives have been used for many years in the repair and strengthening of timber structures, and are currently the most appropriate adhesive type for in-situ operations. Nevertheless, there is still a lack of knowledge about their durability and long-term performance derived from the absence of standards on this issue. This paper describes an experimental campaign developed to address these concerns, which included the development of a test procedure to assess long-term behaviour of bonded-in rod connections. The effect that the type of mixing, curing, and post-curing had on the epoxy adhesive's mechanical properties was also assessed.

From the results, it was seen that the mixing procedure influences the mechanical properties of the cured adhesive, and its effects varied with the different adhesives tested. Post-curing the adhesives was beneficial, but with different magnitudes for each adhesive. The data obtained using the new test procedure are, so far, encouraging, providing very different behaviours depending on the system employed.

KEYWORDS

Epoxy adhesives, Service conditions, Performance, Durability assessment.

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