Bond Strength of FRP Laminates to Concrete: State-of-the-Art Review

E.Y. Sayed-Ahmed
Professor, Structural Engineering Dept., Ain Shams Universit,Cairo, Egypt.
Senior Structural Engineer, Dar Al-Handasah, Cairo, Egypt
R. Bakay
Design Engineer, Read Jones Christofferson, Calgary, Canada
N.G. Shrive
Killam Memorial Research Professor of the University of Calgary. Civil Engineering Dept.,
University of Calgary, Calgary, Canada

ABSTRACT

Rehabilitation of existing infrastructure has become a priority in recent years as an alternative to the daunting costs of rebuilding structures. Traditional repair methods have drawbacks, many of which can be overcome through the use of fibre reinforced polymer FRP laminates. However, the behaviour of FRP rehabilitated structures has yet to be conveniently and accurately modelled in many situations. For example, better understanding of their failure modes will allow for more precise designs that will balance safety and cost. To strengthen an RC beam or slab for flexure, FRP laminates are usually bonded externally on the structural element. A common failure mode encountered in initial tests was the laminate debonding from the surface. Here, the bond strength and modes of debonding between the FRP laminates and reinforced concrete members strengthened in flexure are reviewed. Current models for predicting the bond strength between the laminates and concrete are also scrutinized.
