

## Articularities of Analysis and Behaviour of Concrete Beams Reinforced with Fibrous Polymer Composite Bars

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### Abstract text:

Traditional steel based reinforcement systems for concrete elements are facing with serious problems mainly caused by corrosion due to chemically aggressive environments and salts used in deicing procedures, especially in case of bridge steel reinforced concrete girders. Also in some cases special applications require structural members with magnetic transparency. An alternative to this major problem has recently become the use of fiber reinforced polymer (FRP) composite bars as internal reinforcement for concrete beams. The particularities of their mechanical properties are making the design process a difficult task for engineers, numerous research centers being involved in correcting this situation. The general aspects concerning the conceiving of FRP reinforced concrete beams are firstly analyzed, compared to those reinforced with steel bars. Some results of a Finite Element Analysis, as part of a complex program which also implies full scale testing of FRP reinforced beams subjected to bending, are given and discussed in the paper. The low elasticity modulus presented by glass fiber reinforced polymer (GFRP) bars does not justify its use from structural point of view when deflection is the limiting condition but for corrosive resistance reasons and special electromagnetic properties this system can be promoted.

### Key Words:

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